TETRA TECH

August 18, 2016

Mr. Cody McLarty
Task Order Manager
U.S. Environmental Protection Agency, Region 7
11201 Renner Boulevard
Lenexa, Kansas 66219

Subject: **Removal Site Evaluation Report**
Southwest Jefferson County Mining / Camp Ne-O-Tez Site
Jefferson County, Missouri
EPA CERCLIS ID No.: MON000705443
U.S. EPA Region 7 START 4, Contract No. EP-S7-13-06, Task Order No. 0143
Task Monitors: Cody McLarty & Greg Bach, Remedial Project Managers

Dear Mr. McLarty and Mr. Bach:

Tetra Tech EM Inc. is submitting the attached removal site evaluation report regarding the Southwest Jefferson County Mining – Camp Ne-O-Tez site in Jefferson County, Missouri. If you have any questions or comments, please call the START Project Manager at [redacted]

Sincerely,

April Halley

April Halley
START Project Manager

for David A. Zimmerman

Ted Faile, PG, CHMM
START Program Manager

Enclosure

cc: Debra Dorsey, START Project Officer (cover letter only)
Greg Bach, EPA Region 7 Remedial Project Manager

X9025.16.0143.000

415 Oak St
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REMOVAL SITE EVALUATION REPORT
SOUTHWEST JEFFERSON COUNTY MINING – CAMP NE-O-TEZ SITE, JEFFERSON COUNTY, MISSOURI
EPA ID MON000705443

Superfund Technical Assessment and Response Team (START) 4
Contract No. EP-S7-13-06, Task Order No. 0143

Prepared For:

U.S. Environmental Protection Agency
Region 7
11201 Renner Boulevard
Lenexa, Kansas 66219

August 18, 2016

Prepared By:

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APPENDICES

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ATTACHMENTS

TABLES

1.0 INTRODUCTION

The Tetra Tech, Inc. (Tetra Tech) Superfund Technical Assessment and Response Team (START) was tasked by the U.S. Environmental Protection Agency (EPA) Region 7 Superfund Division to conduct a removal site evaluation (RSE) at the Southwest Jefferson County Mining – Camp Ne-O-Tez site (the site) in Jefferson County, Missouri. Purposes of the investigation were to: (1) evaluate whether any threats to human health or the environment exist because of possible impacts of past mining activities on surface soils, groundwater, surface water, and sediment; and (2) determine whether a removal action would be warranted. A quality assurance project plan (QAPP) for this investigation was submitted to EPA on May 16, 2016 (Tetra Tech 2016).

The RSE included collection of the following samples: surface soil samples within open or high-use areas (play areas), groundwater samples from an on-site private water well, and sediment and surface water samples from within and around an on-site creek. This evaluation conformed to the National Oil and Hazardous Pollution Contingency Plan (NCP), 40 *Code of Federal Regulations* (CFR) 300.415(b)(2).

April Halley was the Tetra Tech START Project Manager for RSE activities. EPA Task Order Managers for the project were Cody McLarty (primary) and Greg Bach (alternate).

2.0 BACKGROUND INFORMATION

Section 2.0 provides information on the site location, description, operational history, and previous investigations.

2.1 SITE LOCATION AND DESCRIPTION

The site is in De Soto, Missouri, along the southwest edge of Jefferson County. The County is within the northern portion of an area known as the Old Lead Belt where mining began in the early 1700s. Mine waste has been transported by the Big River and relocated to areas throughout Jefferson County. In residential areas, this material has been used as topsoil, fill material, and aggregate for roads.

The site is directly downgradient of a historical mining site. An on-site intermittent stream channels runoff from the historical mining area and runs through the site and into the Big River. The southern portion of the site is within the Big River floodplain. The camp sits on approximately 140 acres of woods and includes several cabins. Use of the site is primarily for youth church camps and events throughout the summer.

Figure 1 in Appendix A depicts the general aerial and topographic layout of the site. Figure 2 in Appendix A shows areas sampled during this investigation.

2.2 SITE GEOLOGY

Missouri is part of the North American craton, a tectonically stable area throughout most recent geologic time. However, the area has undergone some deformation, as shown by faults and by upwarps and downwarps on the surface of the crystalline Precambrian rocks that underlie Paleozoic and younger sedimentary rocks (U.S. Geological Survey [USGS] 1997).

The uppermost bedrock in the area includes the Cambrian Derby-Doerun Dolomite, which consists of dolomite with alternating siltstone and shale. Beneath the Derby-Doerun Dolomite lies the Davis Formation, which consists of glauconitic shale, sandstone, limestone, and dolomite. Beneath the Davis formation lies the Bonneterre Formation consisting of dolomite and local dolomitic limestone. Some parts are glauconitic. The Bonneterre is a host rock for lead ore deposits (USGS 2014).

2.3 PREVIOUS INVESTIGATIONS

No previous investigations have occurred at the site. However, based on data acquired by EPA at other sites within the Old Lead Belt and proximity of the site to a historical mining area, it is reasonable to believe that portions of the site have been impacted by past lead mining operations.

2.4 OTHER INVESTIGATIONS

On June 3, 2016, the week following RSE sampling, START sampled soil in the yard, landscape, and driveway surrounding the residence/office on the Camp Ne-O-Tez property. This sampling proceeded under a residential sampling task order associated with a separate QAPP. The yard and landscaping around the house were found to contain elevated lead concentrations. The result from the landscaping was 420 parts per million (ppm), while results from two areas of yard around the house were 1,423 and 2,659 ppm. The drip zone, two driveways, and two additional areas of yard farther from the house were also sampled, but none yielded results exceeding the action level of 400 ppm. The residence/office is at the north end of the property. The field form for this sampling event is in Attachment 1.

3.0 REMOVAL SITE EVALUATION

Sampling for this RSE occurred on May 24, 2016. Tetra Tech START collected soil, sediment, groundwater, and surface water samples to delineate extent of metals contamination in those media at the site. Site activities were documented in a field logbook (see Appendix B). Field sheets are provided in Appendix C. The following text discusses sampling by matrix.

3.1 SOIL SAMPLING SUMMARY

Surface soil samples were collected within four pre-determined high-use areas (see Appendix A, Figure 2). Pre-determined soil sampling areas are defined as follows: Area 1 is a gathering spot and picnic area near the stream. Area 2 is a volleyball court and sandy area near the stream. Area 3 is an open baseball field near the stream. Area 4 is an open camping area on the floodplain of the Big River. Surface soil samples were collected by application of an incremental soil sampling strategy. This sampling strategy involved collection of many samples (or increments) composited for analysis. Individual Decision Units (DU) were established within each pre-determined sampling area and subdivided into as many as four quadrants or Sampling Units (SU). The number of DUs within each sampling area was based on the size of the sampling area. Maximum size of each SU was 100 by 100 feet, and thus maximum size of each DU was 200 by 200 feet. A composite sample from each SU consisted of nine aliquots collected in a grid pattern within 0-2 inches below ground surface (bgs). Then, approximately equal portions of the composite samples collected from SUs within a given DU were combined to create a "top-tier" composite sample representing the entire DU.

All soil samples were transported to the sample preparation facility where each sample was transferred to a clean, dedicated pie pan. Because moisture content of a soil sample can adversely affect accuracy of readings for lead from an x-ray fluorescence (XRF) spectrometer, the samples were allowed to completely air dry. Once dried, the samples were homogenized and passed through a number 10 sieve (2-millimeter). START analyzed all top-tier composite DU samples and all SU samples for lead by use of a field-portable XRF spectrometer. Three separate XRF readings from each analyzed sample were taken, and the average of these three readings was calculated and recorded. Four top-tier DU samples, representing different ranges of lead concentrations as indicated by XRF analysis, were to be submitted for laboratory confirmation analysis for total target analyte list (TAL) metals (excluding mercury) and for bioavailability analysis. Prior to transport of these samples to the laboratory, they were further processed by use of a number 60 sieve (0.25-millimeter), and were re-analyzed by use of an XRF spectrometer. The average of three readings from each sample was recorded.

3.2 GROUNDWATER SAMPLING SUMMARY

Two groundwater samples—unpurged and purged—were collected from two outdoor spigots, one at the office cabin and one at the camp store (see Appendix A, Figure 2). The unpurged sample was immediately collected upon discharge from the sampling location. The supply line(s) were then purged for 5 minutes before the second sample was collected. One liter of each sample was collected directly into the sample container, and that portion was analyzed for total TAL metals (excluding mercury) and for hardness. Before collection into the sample container, a second liter of each sample was field-filtered by use of a vacuum pump with a pore size for the filter cartridges of 0.45 microns; that portion was analyzed for dissolved TAL metals (excluding mercury). All samples were preserved with nitric acid at pH less than 2. Sample results were compared to the 15 parts per billion (ppb) action level for lead in drinking water.

3.3 SEDIMENT/SURFACE WATER SAMPLING SUMMARY

Eight sediment samples were collected from the bed and banks of the on-site intermittent stream. Five surface water samples were collected at or near sediment samples (see Appendix, Figure 2). Surface water and sediment samples were collected in areas of accumulated sediment, such as dam locations along the waterway or along the banks in areas used for stream access. To avoid cross-contamination, collection of the surface water and sediment samples began at the most downstream location and proceeded in the upstream direction.

One liter of each surface water sample was collected directly into the sample container, to be analyzed for total TAL metals (excluding mercury) and for hardness. Another liter of each surface water sample was field-filtered by use of a vacuum pump with a pore size for the filter cartridges of 0.45 microns before collection into the sample container, and was analyzed for dissolved TAL metals (excluding mercury). All surface water samples were preserved with nitric acid at pH less than 2. Surface water results will be reviewed by the EPA Project Manager during a risk assessment.

Sediment samples were collected within 0-2 inches of the surface water-sediment interface by use of stainless steel garden trowels. All sediment samples were transported to the sample preparation facility where each sample was transferred to a clean, dedicated pie pan. Because moisture content of a sediment sample can adversely affect accuracy of readings for lead from an XRF spectrometer, the samples were allowed to completely air dry. Once dried, the samples were homogenized and passed through a number 10 sieve (2-millimeter). START analyzed each sample for lead by use of a field-portable XRF spectrometer. Four sediment samples, representing different ranges of lead concentrations as indicated by

XRF analysis, were to be submitted for laboratory confirmation analysis for total TAL metals (excluding mercury) and for bioavailability analysis. Prior to transport of these samples to the laboratory, they were further processed by use of a number 60 sieve (0.25-millimeter) and re-analyzed by use of an XRF spectrometer. The average of three readings from each sample was recorded.

4.0 ANALYTICAL DATA SUMMARY

Sections 4.1 and 4.2 summarize analytical data from the soil, sediment, surface water and groundwater samples collected during the RSE. Results are further summarized on Figures 3 through 7 in Appendix A.

4.1 SOIL AND SEDIMENT SAMPLES

For the RSE, Tetra Tech START sampled seven DUs for analysis for metals contamination (primarily lead) in soil. Of these, DU 3 and DU 7 contained lead concentrations below the EPA Region 7 screening goal of 400 ppm (see Appendix A, Figures 4 and 6). The DU 6 top-tier sample contained lead at 336 ppm after processing by use of a number 10 sieve, but that same processed sample contained lead at 428 ppm following subsequent processing by use of a number 60 sieve, and the subsequent lab result was 439 ppm (see Appendix A, Figure 5). The top-tier DU samples of DU 1, DU 2, DU 4, and DU 5 contained lead at concentrations above 400 ppm (see Appendix A, Figures 6 and 7). Most samples from individual Sampling Units within these DUs also contained lead at concentrations above 400 ppm.

Tetra Tech START collected eight sediment samples for analysis for metals contamination (primarily lead). Of these, Sediment 2 contained lead at less than 400 ppm (see Appendix A, Figure 6). Sediment 1, Sediment 4, Sediment 5, Sediment 6, Sediment 7, and Sediment 8 all contained lead at concentrations above 400 ppm (see Appendix A, Figures 3, 4, 5, and 7). Sediment 3 contained lead at 276 ppm after processing by use of a number 10 sieve, but that same processed sample contained lead at 500 ppm following subsequent processing by use of a number 60 sieve, and the subsequent lab result was 549 ppm (see Appendix A, Figure 6).

Lead results from all soil and sediment samples are listed in Table 1. Results appear from samples processed with a number 10 sieve and then analyzed by use of an XRF spectrometer. Results also appear from samples selected for transport to the EPA Region 7 laboratory, which were processed by use of a number 60 sieve and then analyzed by use of an XRF spectrometer before transport to the laboratory. Laboratory results from those samples derived from analyses for metals in soil via inductively coupled plasma – atomic emission spectrometry (ICP-AES).

TABLE 1

LEAD IN SEDIMENT AND SOIL SAMPLES

Sample	XRF Result		Lab Result
	Sieve No. 10	Sieve No. 60	
Sediment 1	1,578	1,912	1,970
Sediment 2	249	NA	NA
Sediment 3	276	500	549
Sediment 4	529	NA	NA
Sediment 5	550	NA	NA
Sediment 6	417	NA	NA
Sediment 7	577	801	875
Sediment 8	1,475	2,310	2,810
DU 1 (top tier)	2,190	1,962	1,860 FD: 1,810
SU1-A	2,083	NA	NA
SU1-B	1,856	NA	NA
SU1-C	2,226	NA	NA
SU1-D	2,320	NA	NA
DU 2 (top tier)	1,809	NA	NA
SU2-A	2,082	NA	NA
SU2-B	1,629	NA	NA
DU 3 (top tier)	155	166	172
SU3-A	137	NA	NA
SU3-B	85	NA	NA
SU3-C	127	NA	NA
SU3-D	353	NA	NA
DU 4 (top tier)	509	421	434
SU4-A	485	NA	NA
SU4-B	140	NA	NA
SU4-C	736	NA	NA
SU4-D	224	NA	NA
DU 5 (top tier)	682	NA	NA
SU5-A	960	NA	NA
SU5-B	301	NA	NA
DU 6 (top tier)	336	428	439
SU6-A	111	NA	NA
SU6-B	854	NA	NA
SU6-C	122	NA	NA
SU6-D	185	NA	NA
DU 7	92	NA	NA

Notes:

All units are in parts per million (ppm).

XRF value represents average reading for lead after the sample was processed.
Shaded value exceeds the 400 ppm action level for lead.

DU Decision unit
FD Field Duplicate
NA Not analyzed
SU Sampling unit
XRF X-ray fluorescence spectrometer

4.2 GROUNDWATER AND SURFACE WATER SAMPLES

Tetra Tech START collected two groundwater samples—unpurged and purged—from two outdoor spigots, one at the office cabin and one at the camp store (see Appendix A, Figure 3). None of these samples contained total lead at concentration above the EPA Maximum Contaminant Level (MCL) of 15 micrograms per liter (µg/L) for lead in drinking water. No other TAL metals result from groundwater samples exceeded an EPA MCL or regional screening level (RSL).

Five surface water samples were collected at or near sediment sample locations. Total lead concentrations ranged from 2.1 µg/L to 29.2 µg/L in these samples. Surface water sample results will be used by the EPA Project Manager for ecological risk assessment purposes.

Dissolved and total lead results in groundwater and surface water samples are listed in Table 2 below. The laboratory analytical report is in Attachment 2.

TABLE 2

LEAD IN GROUNDWATER AND SURFACE WATER SAMPLES

Sample	Dissolved Lead	Total Lead
Groundwater 1 (Unpurged)	1 U	3.5
Groundwater 1 (Purged)	1 U FD – 1 U	2.1 FD – 2.3
Groundwater 2 (Unpurged)	1 U	7.7
Groundwater 2 (Purged)	1 U	2.1
Surface Water 1	4.4	29.2
Surface Water 2	1	2.6
Surface Water 3	1.2 FD – 1.3	5.9 FD – 3.8
Surface Water 4	2.1	6.8
Surface Water 5	7.9	12.6

Notes:

All units are in micrograms per liter (µg/L)

FD Field Duplicate
U Not detected

5.0 DEVIATIONS FROM THE QUALITY ASSURANCE PROJECT PLAN

To ensure credibility of sample collection, preparation procedures, and analytical data, QA/QC sampling for the project proceeded according to protocols approved by EPA Region 7 for work at hazardous waste sites, in accordance with the QAPP submitted to EPA on May 16, 2016.

Samples were collected, prepared, and analyzed in accordance with the QAPP, with the following exceptions:

- All samples from SUs were processed and analyzed via XRF regardless of lead concentrations in top-tier DU samples.
- Laboratory analysis for bioaccessible lead in soil via ICP-AES was added by the EPA Project Managers and will be used for the human health risk assessment.

6.0 SUMMARY AND CONCLUSIONS

Tetra Tech START sampled at seven DUs, eight sediment locations, five surface water locations, and two groundwater locations for metals contamination (primarily lead).

Of the seven DUs, DU 3 and DU 7 contained lead at concentrations below the EPA Region 7 screening goal of 400 ppm. The top-tier DU 6 sample contained lead at 336 ppm after processing by use of a number 10 sieve, but that same processed sample contained lead at 428 ppm following subsequent processing by use of a number 60 sieve, and the lab result was 439 ppm. Top-tier DU samples from DU 1, DU 2, DU 4, and DU 5 contained lead at concentrations above 400 ppm.

Of the eight sediment samples, Sediment 2 contained lead at less than 400 ppm. Sediment 1, Sediment 4, Sediment 5, Sediment 6, Sediment 7, and Sediment 8 all contained lead at concentrations above 400 ppm. Sediment 3 contained lead at 276 ppm after processing by use of a number 10 sieve, but that same processed sample contained lead at 500 ppm following subsequent processing by use of a number 60 sieve, and the lab result was 549 ppm.

No groundwater sample contained total lead at concentration above the EPA MCL of 15 µg/L for lead in drinking water. No other TAL metals result from groundwater samples exceeded an EPA MCL or RSL.

Surface water samples contained total lead concentrations ranging from 2.1 µg/L to 29.2 µg/L. These results will be used by the EPA Project Manager for ecological risk assessment purposes.

All samples were collected in accordance with the approved QAPP, except as noted in Section 5.0.

6.1 REMOVAL CONSIDERATIONS

Based on information obtained during this RSE and from concurrent residential sampling, a removal action is warranted at the Southwest Jefferson County Mining – Camp Ne-O-Tez site to address contamination in residential soils. Additional risk assessment review is needed to determine if a removal action is also warranted for the sediments on the site.

7.0 REFERENCES

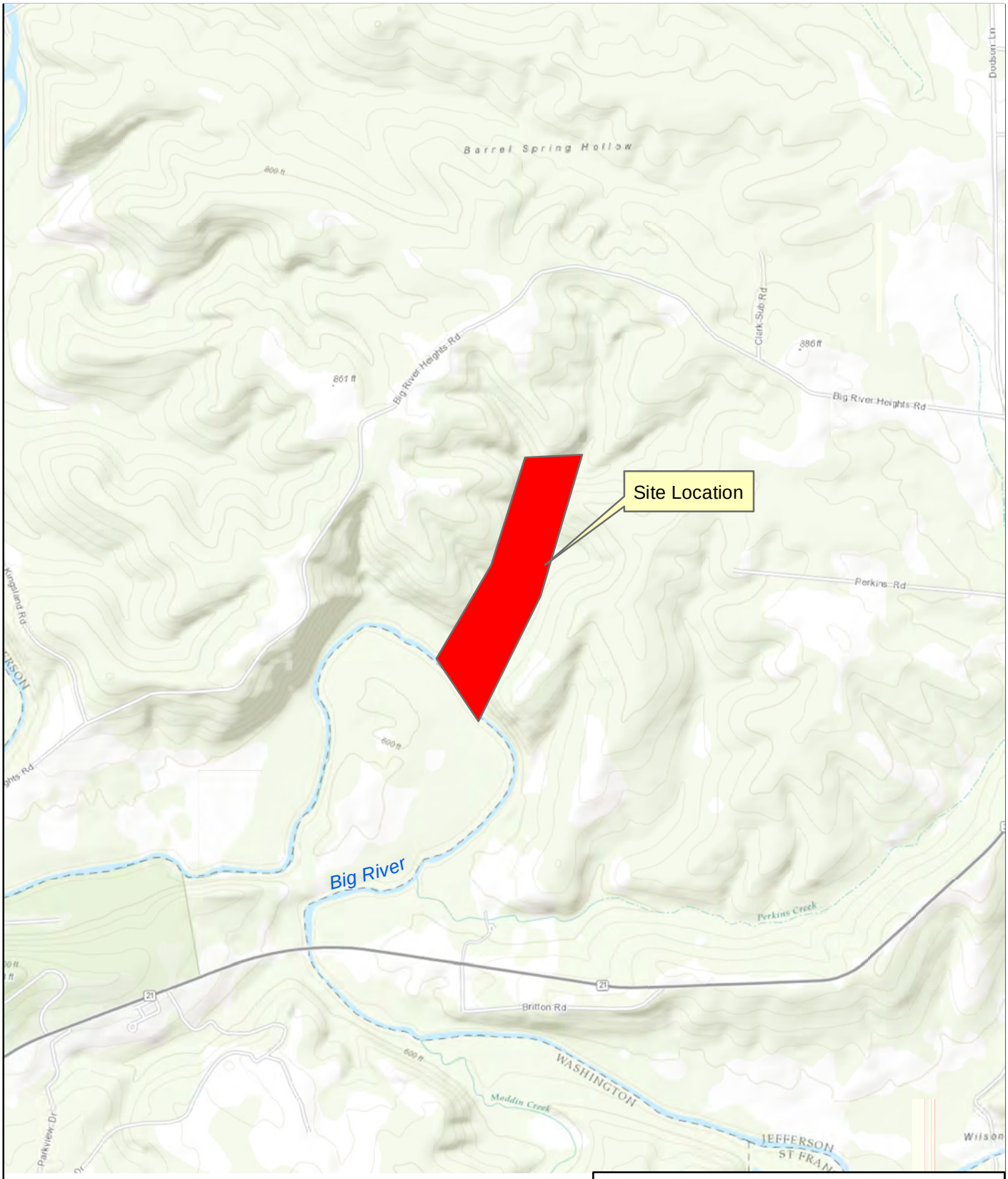
Tetra Tech, Inc. (Tetra Tech). 2016. Quality Assurance Project Plan (QAPP) for sampling at Southwest Jefferson County Mining – Camp Ne-O-Tez Site. May 16.

U.S. Geological Survey (USGS). 1997. Groundwater Atlas of the United States: Kansas, Missouri, and Nebraska. Accessed March 9, 2016. http://capp.water.usgs.gov/gwa/gwa.html

USGS. 2014. Mineral Resources On-line Spatial Data. Official Series Descriptions. Accessed on April 20, 2016. http://mrdata.usgs.gov/geology/state/sgmc-unit.php?unit=MOCAeb;0

APPENDIX A

FIGURES



N

0 1,200 2,400

Feet

Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase,

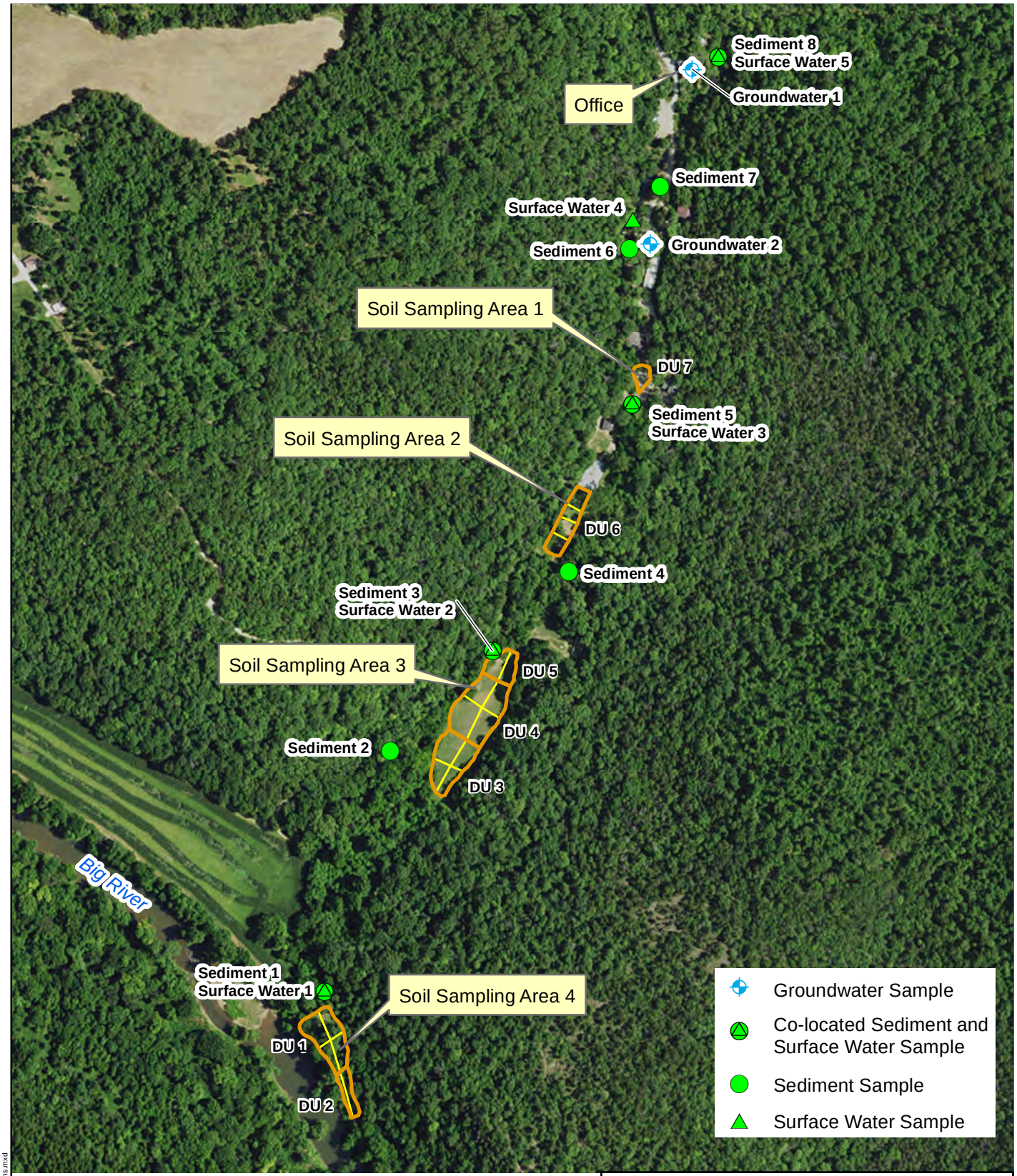
Camp Ne-O-Tez Site
Southwest Jefferson County, Missouri

Figure 1
Site Location

TETRA TECH

Date: 5/2/2016 Drawn By: Michelle Handley

C:\START WORK\Camp Ne-O-Tez\Figure 1 Site Location.mxd



Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping,

N

0 250 500

Feet

Camp Ne-O-Tez Site
Southwest Jefferson County, Missouri

Figure 2
Site Layout and Sample Locations

TETRA TECH

Date: 5/2/2016 Drawn By: Michelle Handley

C:\START WORK\Camp Ne-O-Tez\Figure 2 Sample Locations.mxd

Notes:
1. Lab result is given for soil and sediment samples when available; highest XRF result is given when no lab result is available.

2. Bold, red results exceed removal action levels for soil and sediment, maximum contaminant levels (MCLs) for groundwater and surface water.

3. In the case of a field duplicate, the highest concentration is given.

ppm - parts per million
XRF - x-ray fluorescence
µg/L - micrograms per liter

Groundwater Sample

Co-located Sediment and Surface Water Sample

Sediment Sample

Surface Water Sample

N

0 100 200

Feet

Camp Ne-O-Tez Site
Southwest Jefferson County, Missouri

Figure 3
Lead Results - Office Area

TETRA TECH

Date: 5/2/2016 Drawn By: Michelle Handley

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Notes:
1. Lab result is given for soil and sediment samples when available; highest XRF result is given when no lab result is available.

2. Bold, red results exceed removal action levels for soil and sediment, maximum contaminant levels (MCLs) for groundwater and surface water.

3. In the case of a field duplicate, the highest concentration is given.

DU - decision unit
ppm - parts per million
SU - sampling unit
XRF - x-ray fluorescence

Co-located Sediment and Surface Water Sample

Sample Unit Results

- < 400 ppm
- 400 - 1200 ppm
- > 1,200 ppm

N

0 50 100

Feet

Camp Ne-O-Tez Site
Southwest Jefferson County, Missouri

Figure 4
Lead Results - Sample Area 1

TETRA TECH

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Notes:
1. Lab result is given for soil and sediment samples when available; highest XRF result is given when no lab result is available.

2. Bold, red results exceed removal action levels for soil and sediment, maximum contaminant levels (MCLs) for groundwater and surface water.

3. In the case of a field duplicate, the highest concentration is given.

DU - decision unit
ppm - parts per million
SU - sampling unit
XRF - x-ray fluorescence

Co-located Sediment and Surface Water Sample

Sample Unit Results

- < 400 ppm
- 400 - 1200 ppm
- > 1,200 ppm

N

0 50 100

Feet

Camp Ne-O-Tez Site
Southwest Jefferson County, Missouri

Figure 5
Lead Results - Sample Area 2

TETRA TECH

Date: 5/2/2016 Drawn By: Michelle Handley

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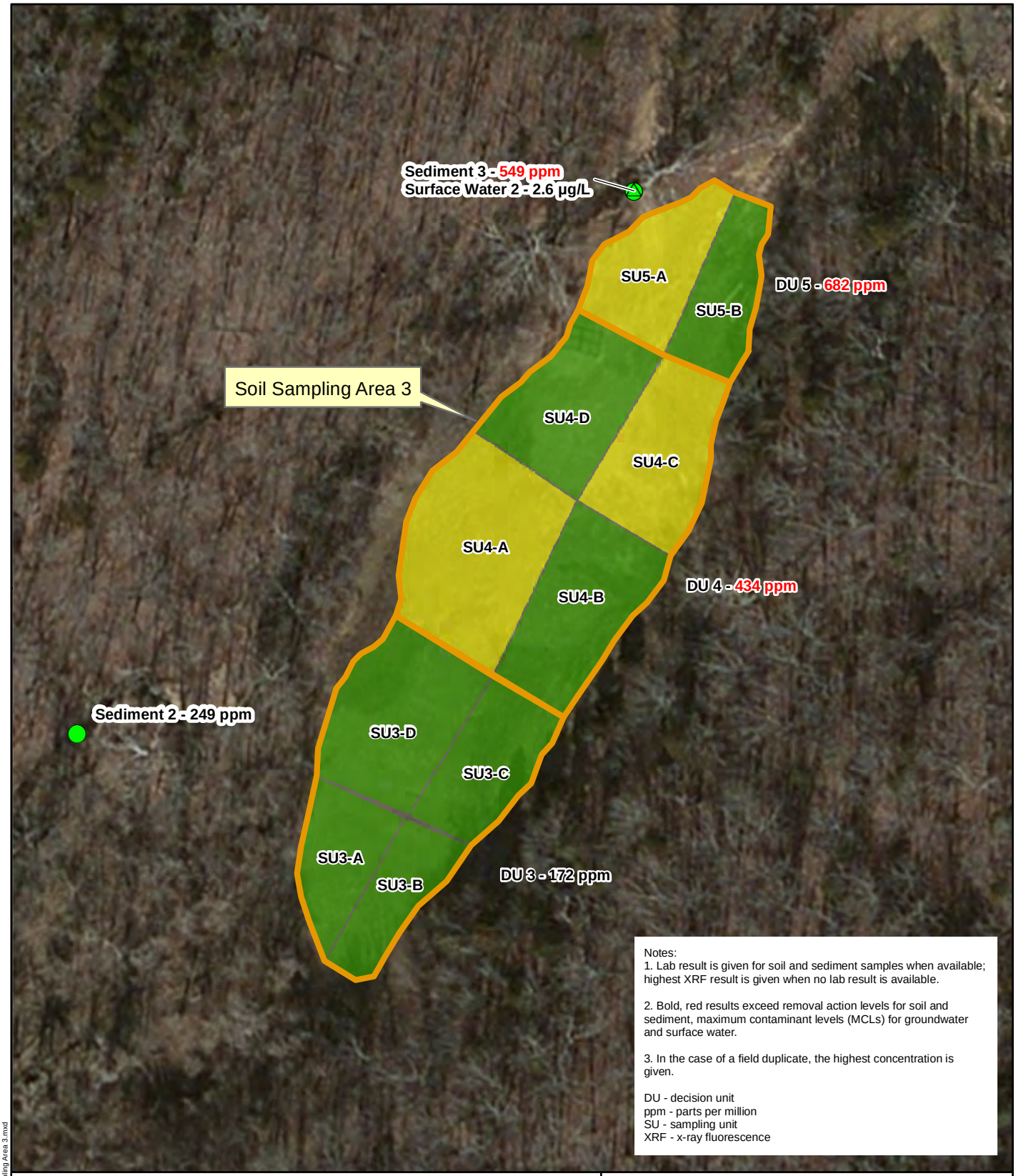

Notes:
1. Lab result is given for soil and sediment samples when available; highest XRF result is given when no lab result is available.

2. Bold, red results exceed removal action levels for soil and sediment, maximum contaminant levels (MCLs) for groundwater and surface water.

3. In the case of a field duplicate, the highest concentration is given.

DU - decision unit
ppm - parts per million
SU - sampling unit
XRF - x-ray fluorescence

Co-located Sediment and Surface Water Sample

Sample Unit Results

- < 400 ppm
- 400 - 1200 ppm
- > 1,200 ppm

N

0 75 150

Feet

Camp Ne-O-Tez Site
Southwest Jefferson County, Missouri

Figure 6
Lead Results - Sample Area 3

TETRA TECH

Date: 5/2/2016 Drawn By: Michelle Handley

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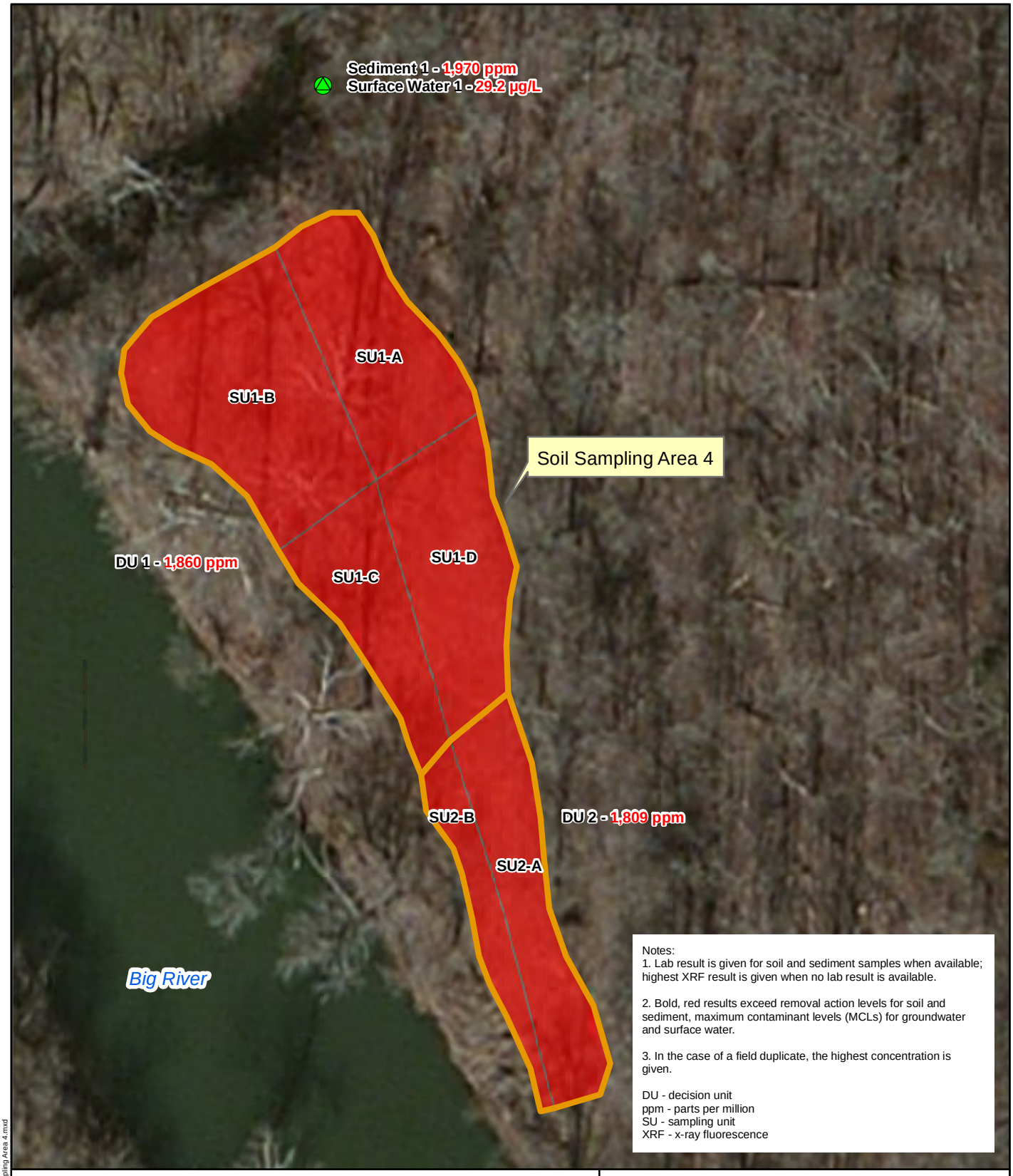

Notes:
1. Lab result is given for soil and sediment samples when available; highest XRF result is given when no lab result is available.

2. Bold, red results exceed removal action levels for soil and sediment, maximum contaminant levels (MCLs) for groundwater and surface water.

3. In the case of a field duplicate, the highest concentration is given.

DU - decision unit
ppm - parts per million
SU - sampling unit
XRF - x-ray fluorescence

Co-located Sediment and Surface Water Sample

Sample Unit Results

- < 400 ppm
- 400 - 1200 ppm
- > 1,200 ppm

N

0 50 100

Feet

Camp Ne-O-Tez Site
Southwest Jefferson County, Missouri

Figure 7
Lead Results - Sample Area 4

TETRA TECH

Date: 5/2/2016 Drawn By: Michelle Handley

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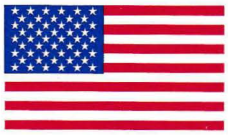
APPENDIX B

FIELD LOGBOOK

Composition

SWJC Camp Ne-O-Tez
103X905216014 3
April 2016 –

100 Sheets • 200 Pages
College Ruled
9 3/4 x 7 1/2 in.



MADE IN USA

4/20/16

SWJC Camp NeOTeZ

1200 leave to have sit walk with EPA McClarty.

1220 38.103435, -90.648219, boundary where streams meet. end of property samples of opportunity, 3 surface waters, 1 by first dam, 2nd dam 2 samples, last ~~Big~~ River. around benches, volleyball by new building & floodplain / sides of dam

1330 Back at field office. Update analyses in QAPP McClarty wants TAL metals for soil & sediment. TAL metals, dissolved metals, & hardness for water samples. Wants surface water sample at both dams and confluence into Big River. Wants sediment samples to correspond at same location of surface water & additional sediment samples on bank. Wants soil sampleing to be incremental and at 3 locations: benches by front office, old volleyball courts, & floodplain cleared out area. Work on other TO.

1600 Work on HASP & QAPP.

1900 End day

ANH
4/20/16

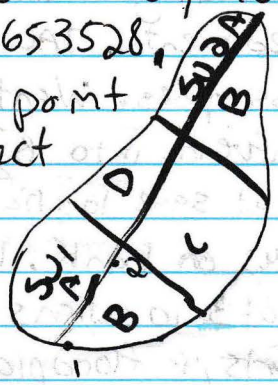
SWJC camp Ne-O-Tez 5/24/16

0800 STM Hally at field office. Load supplies.

0907 At GW1 - unpurged, collected at 38.103052, -90.649615 from office spigot. GO

0926 At GW1 - purged, collected from spigot. & FD

1000 At Soil Sampling Area 4. Back middle. DU1 38.095495, -90.653772, Middle 38.095235, -90.653528, Next 38.094967, -90.653461 End point 38.094613, -90.653341



Collect Collected DU1 (A-D) & DU2 (A-B)

A towards Road.

1038 Collect Sediment 1 at 38.095680, -90.653200

1035 Collect (co-located) SW-1,

1044 At Soil Sample ~~Area~~ 3, ~~collect~~.
38.096843, -90.652398 (1), 38.097459, -90.652327 (2)
38.097690, -90.652128 (3), 38.097935, -90.651954 (4)
38.098173, -90.651789 (5), 38.098394, -90.651639
Collect DU3 (A-D), DU4 (A-D), DU5 (A-B).

1108 At Sediment ~~2~~ 3 ~~for~~ SW-3 38.098367, -90.651823

1113 Sediment 2 ~~(SW-2)~~ 38.097576, -90.652907

1141 At Soil sample Area 2. 38.099544, -90.650875 (1)
38.099495, -90.650863 (2), 38.099402, -90.650696 (3)
38.099249, -90.650986 (4) 38.099091, -90.651156 (5)
Collect DU6 (A-D)

1155 At Sediment 4 38.098993, -90.651019 Collected.

1203 At Soil Sample Area 1. Collect DU7
38.100582, -90.650281 Collect DU7

5/24/16

SW JC Camp Ne-Otex

1210 At Sediment 5, 38.100315, -90.650285. Colocated w/ SW-3.

1232 At ~~Sediment 6~~ SW-4, 38.101844, -90.650269. Collect SW-4, ~~Co-located w/ sed 6~~, AM

1246 At Sediment 6, 38.101609, -90.650308, collected.

1254 At GW 2, 38.101643, -90.650093. Collect from spigot purged + un-purged samples.

1300 Collect FB

1311 At Sediment 7 38.102107, -90.649978, Collected.

1318 At Sediment 8 38.103145, -90.649344 Collected

1320 At SW-5, co-located w/Sediment 8. Collected.

1334 Go back to take pictures.

1428 Back at field office, Pan samples, Preserve waters.

1537 Start to label waters for lab. Tape labels

1700 ST M Halley offsite for end day.

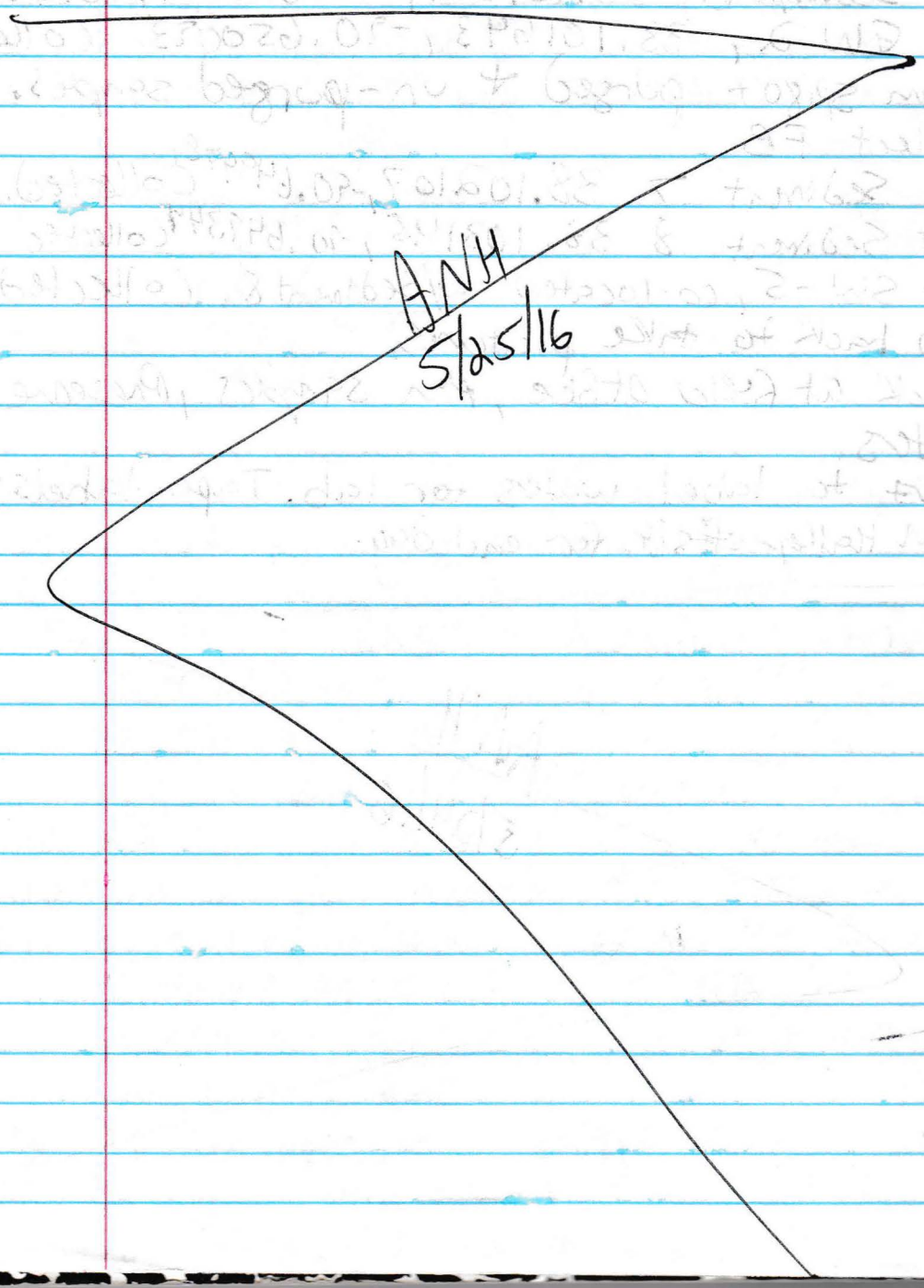
AMH
5/24/16

SWJC Camp Ne-O-Te 5/25/16

1600 Label bags, pound & sieve. Combine sampling units into Decision units.

1655 Send monthly report.

1700 SSM Halley end day.



SW JC Camp Ne-O-Tex 5/26/16

1345 STM Halley pound & sieve samples.

1425 Calibrate XRF #1934 using RCRA 500 standard XRF Reads: 466±35, GBW 2700 standard XRF Reads: 2552±80, Blank Reads: <8.6 System check OK.

	Sediment 1		*Not 10% Delete Sediment 2		*Not 10% Delete Sediment 2		*Not 10% Delete Sediment 2
249	1598±57	253	453±30	257	257±24	261	309±25
250	1565±56	254	208±20	258	283±24	262	202±20
251	1569±56	255	274±23	259	184±19	263	193±20
252	1578±56	256	312±25	260	241±22	264	235±22

	Sediment 2		*Not 10% Delete Sediment 3		Sediment 3		*Delete Sediment 4
265	290±24	269	315±25	273	252±22	278	724±38
266	239±23	270	290±24	274	265±23	278	471±31
267	219±21	271	415±29	275	311±25	279	362±27
268	249±23	272	340±26	276	276±24	280	519±32

	Sediment 4		Sediment 5		*Delete Do not Use Sediment 6		Sediment 6
281	572±34	285	513±33	289	475±32	292	330±27
282	497±32	286	656±38	290	363±28	293	446±31
283	517±32	287	481±32	291	373±29	294	475±31
284	529±33	288	550±34	292	404±30	295	417±30

	Sediment 7		Sediment 8		DU 1		SU1-A
296	560±34	300	1566±61	304	2230±67	308	2058±64
297	479±32	301	1281±54	305	2165±66	309	2030±64
298	691±37	302	1578±60	306	2175±66	310	2163±66
299	577±34	303	1475±58	307	2190±66	311	2083±65

→ say 58 in ppt

SWJC Camp Ne-O-Tez 5/26/16

SU1-B		SU1-C		SU1-D		DU2	
312	1856 ± 61	316	2331 ± 69	320	2296 ± 68	324	1729 ± 58
313	1899 ± 62	317	2173 ± 67	321	2320 ± 68	325	1859 ± 61
314	1891 ± 62	318	2174 ± 66	322	2343 ± 68	326	1840 ± 61
315	1882 ± 62	319	2226 ± 67	323	2320 ± 68	327	1809 ± 60

SU2-A		SU2-B		DU3		SU3-A	
328	2083 ± 64	332	1624 ± 57	336	156 ± 18	340	138 ± 18
329	2047 ± 65	333	1664 ± 57	337	161 ± 19	341	145 ± 18
330	2115 ± 64	334	1598 ± 55	338	148 ± 16	342	129 ± 17
331	2082 ± 64	335	1629 ± 56	339	155 ± 18	343	137 ± 17

SU3-B		SU3-C		★ Not 100% Delete SU3-D		SU3-D	
344	82 ± 14	348	123 ± 17	352	302 ± 25	356	342 ± 26
345	81 ± 14	349	134 ± 17	353	370 ± 28	357	357 ± 27
346	92 ± 15	350	125 ± 17	354	557 ± 33	358	360 ± 27
347	85 ± 14	351	127 ± 17	355	410 ± 29	359	353 ± 27

DU4		SU4-A		SU4-B		SU4-C	
360	478 ± 31	364	487 ± 31	368	117 ± 17	371	729 ± 38
361	420 ± 29	365	525 ± 32	369	170 ± 20	372	738 ± 38
362	636 ± 35	366	444 ± 30	370	132 ± 18	373	741 ± 38
363	509 ± 32	367	485 ± 31	~~371~~	140 ± 18	374	736 ± 38

SU4-D		DU5		SU5-A		SU5-B	
375	223 ± 22	379	720 ± 39	383	992 ± 45	387	303 ± 25
376	255 ± 23	380	695 ± 37	384	915 ± 43	388	310 ± 25
377	194 ± 20	381	630 ± 35	385	973 ± 44	389	291 ± 24
378	224 ± 22	382	682 ± 37	386	960 ± 44	390	301 ± 25

SWJC Camp Ne-O-Tez 5/26/16

	DU6		SU6A		SU6B		SU6-C
391	341 ± 26	395	136 ± 18	399	890 ± 43	403	102 ± 14
392	328 ± 25	396	106 ± 16	400	796 ± 40	404	133 ± 16
393	340 ± 26	397	90 ± 15	401	878 ± 42	405	132 ± 16
394	336 ± 25	398	111 ± 16	402	854 ± 42	406	122 ± 15

	SU6-D		DU7
407	227 ± 21	411	100 ± 15
408	170 ± 19	412	92 ± 15
409	157 ± 18	413	84 ± 14
410	185 ± 19	414	92 ± 15

1656 Calibrate XRF #1934 using RCRA 500 standard XRF Reads: 480 ± 34, Blank Reads: <8.9, GBW 2700 XRF Reads: 2588 ± 80, System check OK.

1700 End day

ANM
5/26/16

SWSC Camp Ne-O-Tez 6/1/16

1125 Calibrate XRF #1934 using RCRA 500 standard, XRF Reads: 467 ± 35, GBW 2700 standard Reads: 2581 ± 80
Blank Reads: <8.9, system check OK.
XRF Results post NO. 60 sieve.

	Sediment 1		Sediment 3		Sediment 7		Sediment 8
505	1969 ± 64	509	493 ± 33	513	841 ± 45	517	2462 ± 81
506	1848 ± 63	510	471 ± 33	514	706 ± 40	518	2240 ± 81
507	1920 ± 63	511	536 ± 34	515	855 ± 44	519	2228 ± 78
508	1912 ± 63	512	500 ± 33	516	801 ± 43	~~520~~	2310 ± 80

	DU1		DU3		DU4		DU6
520	1989 ± 65	523	166 ± 19	527	411 ± 31	531	460 ± 30
521	1993 ± 66	524	167 ± 19	528	434 ± 30	532	439 ± 31
522	1905 ± 66	525	165 ± 20	529	418 ± 32	533	385 ± 30
~~523~~	1962 ± 65	526	166 ± 19	530	421 ± 31	534	428 ± 30

1225 Send updated Results to EPA McCarty & map made by Michelle. Work on other TO's.

1330 Call EPA Robler to ask whether to mark dryed & sieved sediment samples as sediment or soil on the chain of custody. She says to mark as soil on COC, end day

ANH
6/1/16

ATTACHMENT 1

SOUTHWEST JEFFERSON COUNTY MINING SCREENING FORM – PROPERTY ID 2848

Property ID: 2848

Owner Name: Nate Rieser

Address: 6266 Big River Heights Rd. DeSoto, MO

SW Jefferson County Mining Screening Form

North Arrow

Sample Area Pre Ex XXX

	Pre	Post
Cell 1:	1423	
Cell 2:	2659	
Cell 3:	241	
Cell 4:	346	
Cell 5:		

Sample Area Post Ex (XXX)

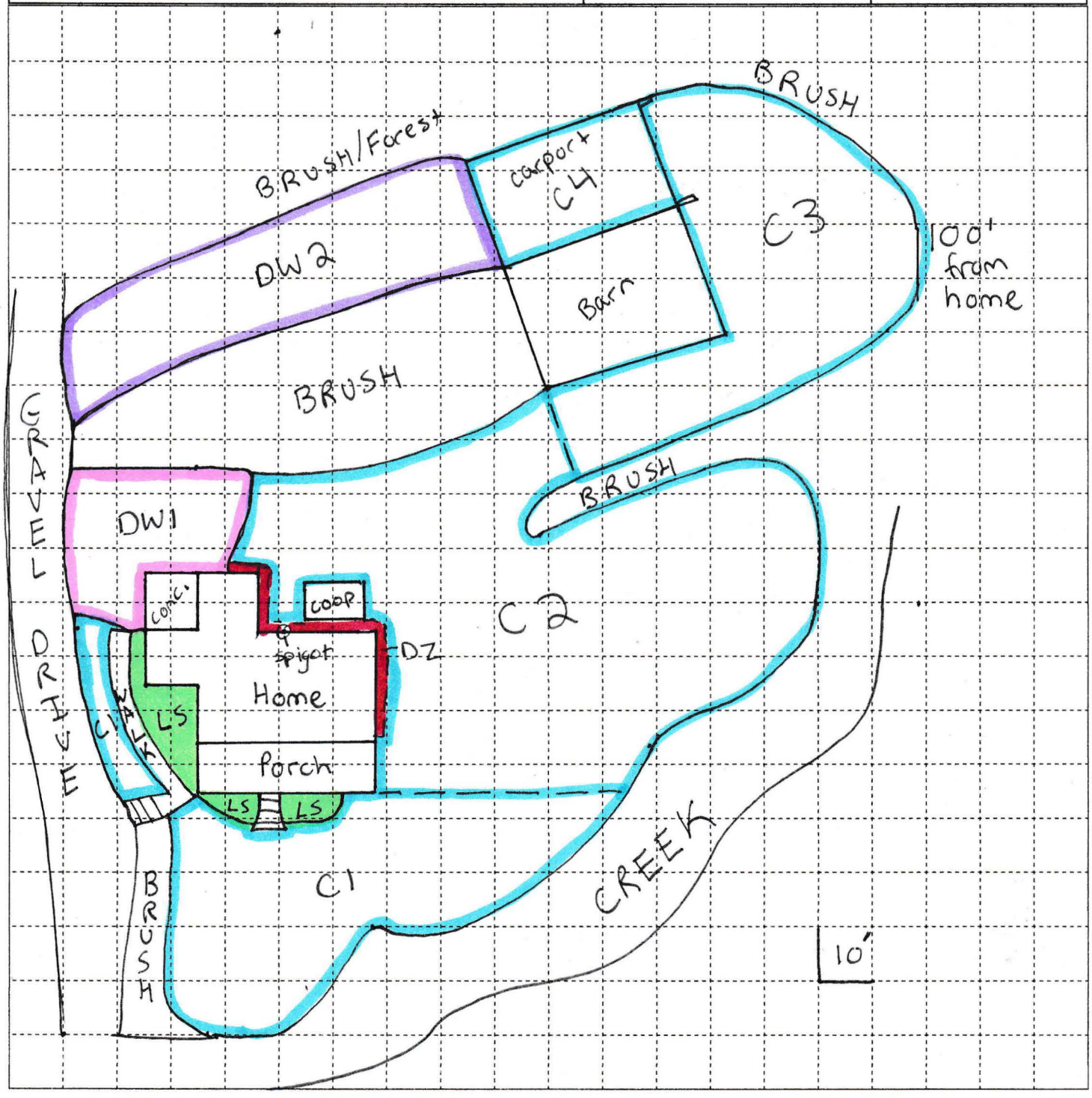
	Pre	Post
DW 1:	186	
DW 2:	79	
Garden:		
Play Area:		
Landscape:	420	

	Pre	Post
Drip Zone:	254	
Other ( ):		
Other ( ):		

All reading units are milligrams/ kilogram (mg/kg) lead (Pb).

Pre Ex Samples Collected
Initials: AH LJ
Date: 6/3/16
Time: 0853

Pre Ex Samples Analyzed
Initials: AW
Date: 6-13-16
Time: 1509
XRF #: 1533



Property ID: 2848

General Information / Comments

Owner Information (if different from front)

Telephone No. [redacted] Circle all that apply: tenant (owner) home work cell

Telephone No. _____ Circle all that apply: tenant owner home work cell

Telephone No. _____ Circle all that apply: tenant owner home work cell

Property Owner: _____ Mailing Address: _____

City, State: _____ Zip: _____

Physical Description of House or Property (include age of home if known)

Private Drinking Water Well (Yes) No Unknown

Notes:

GPS Coordinates:	**Latitude** 38.103039	**Longitude** -90.649665

Total Number of residents: 1

Number of Children less than 84 months (7 yrs) of age:

Date Access to Screen Granted: 3-14-16

Description of historic mining activities or mining material (e.g. tailings, chat, tiff) present on property:

Remediation Information

yd³ removed:	**Tons removed:**
Sod ft²:	**Hydro seed ft²:**

yd³ backfill:	**Gravel:**	**Pea Gravel:**

General Excavation Comments:

ATTACHMENT 2

CHAIN-OF-CUSTODIES, FIELD SHEETS, AND ANALYTICAL DATA PACKAGE

CHAIN OF CUSTODY RECORD
ENVIRONMENTAL PROTECTION AGENCY REGION VII

ACTIVITY LEADER(Print)	NAME OF SURVEY OR ACTIVITY	DATE OF COLLECTION (DAY / MONTH / YEAR)	SHEET
Cody McLarty	SWJC Camp Ne-O-Tez	24 / 5 / 2016	1 of 1

CONTENTS OF SHIPMENT

SAMPLE NUMBER	TYPE OF CONTAINERS: CUBITAINER	BOTTLE (2-liter)	BOTTLE (2-liter)	BOTTLE	VOA SET (2 VIALS EA)	SAMPLED MEDIA: water	soil	sediment	dust	other	RECEIVING LABORATORY REMARKS/OTHER INFORMATION (condition of samples upon receipt, other sample numbers, etc.)
	NUMBERS OF CONTAINERS PER SAMPLE NUMBER										
7153-1		X					X				
2											
3											
4											
5											
5-FD											
6											
7											
8											
101			X			X					Need detection limits below drinking water MCLs.
102											
102-FD											
103											
104											
105											
106											
107											
107-FD											
108											
109	X										
110-FB											
		ASR complete 6/2/16 AH									

DESCRIPTION OF SHIPMENT

33 PIECE(S) CONSISTING OF _____ BOX(ES)

1 ICE CHEST(S): OTHER _____

MODE OF SHIPMENT

_____ COMMERCIAL CARRIER _____

X COURIER

_____ SAMPLER CONVEYED _____ (SHIPPING DOCUMENT NUMBER)

PERSONNEL CUSTODY RECORD

RELINQUISHED BY (SAMPLER)	DATE	TIME	RECEIVED BY	REASON FOR CHANGE OF CUSTODY
April Malley [X] SEALED [ ] UNSEALED	6/2/16	0800	[ ] SEALED [ ] UNSEALED	
RELINQUISHED BY [ ] SEALED [ ] UNSEALED	DATE	TIME	RECEIVED BY [ ] SEALED [ ] UNSEALED	REASON FOR CHANGE OF CUSTODY
RELINQUISHED BY [ ] SEALED [ ] UNSEALED	DATE	TIME	RECEIVED BY [ ] SEALED [ ] UNSEALED	REASON FOR CHANGE OF CUSTODY

*U.S. GPO: 2002-756-917/40053

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 7153 **Sample Number:** 1 **QC Code:** __ **Matrix:** Solid **Tag ID:** 7153-1-__

Project ID: CMA7D24 **Project Manager:** Cody McLarty
Project Desc: SW Jefferson County Mining
City: DeSoto **State:** Missouri
Program: Superfund
Site Name: SOUTHWEST JEFFERSON COUNTY MINING - UNCONSOLIDATED MINE WASTE **Site ID:** A7D2 **Site OU:** 04

Location Desc: Sediment 1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 5/24/16 10:30
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - ~~8 oz glass~~ 4 oz whirl pak	4 Deg C	180 Days	1 Metals in Solids by ICP-AES
0 -	4 Deg C	Days	1 Percent Solid
			1 Bioaccessible Lead in Soil by ICP-AES

Sample Comments:

(N/A)

Co-located with SW-1

NO.10 sieve = 1,578 ppm Pb
NO.60 sieve = 1,912 ppm Pb

Sample Collected By: TT

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 7153 **Sample Number:** 2 **QC Code:** __ **Matrix:** Solid **Tag ID:** 7153-2-__

Project ID: CMA7D24 **Project Manager:** Cody McLarty
Project Desc: SW Jefferson County Mining
City: DeSoto **State:** Missouri
Program: Superfund
Site Name: SOUTHWEST JEFFERSON COUNTY MINING - UNCONSOLIDATED MINE WASTE **Site ID:** A7D2 **Site OU:** 04

Location Desc: Sediment 3

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 5/24/16 11:08

Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - ~~8 oz glass~~ 4 oz whirl pak	4 Deg C	180 Days	1 Metals in Solids by ICP-AES
0 -	4 Deg C	Days	1 Percent Solid
			1 Bioaccessible Lead in Soil by ICP-AES

Sample Comments:

(N/A)

Co-located with SW-2

NO.10 sieve = 276 ppm Pb

NO.60 sieve = 500 ppm Pb

Sample Collected By: TT

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 7153 **Sample Number:** 3 **QC Code:** __ **Matrix:** Solid **Tag ID:** 7153-3-__

Project ID: CMA7D24 **Project Manager:** Cody McLarty
Project Desc: SW Jefferson County Mining
City: DeSoto **State:** Missouri
Program: Superfund
Site Name: SOUTHWEST JEFFERSON COUNTY MINING - UNCONSOLIDATED MINE WASTE **Site ID:** A7D2 **Site OU:** 04

Location Desc: Sediment 7

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 5/24/16 13:11

Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - ~~8 oz glass~~ 4 oz whirl pak	4 Deg C	180 Days	1 Metals in Solids by ICP-AES
0 -	4 Deg C	Days	1 Percent Solid
			1 Bioaccessible Lead in Soil by ICP-AES

Sample Comments:

(N/A)

No. 10 sieve = 577 ppm Pb
No. 60 sieve = 801 ppm Pb

Sample Collected By: TT

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 7153 **Sample Number:** 4 **QC Code:** __ **Matrix:** Solid **Tag ID:** 7153-4-__

Project ID: CMA7D24 **Project Manager:** Cody McLarty
Project Desc: SW Jefferson County Mining
City: DeSoto **State:** Missouri
Program: Superfund
Site Name: SOUTHWEST JEFFERSON COUNTY MINING - UNCONSOLIDATED MINE WASTE **Site ID:** A7D2 **Site OU:** 04

Location Desc: Sediment 8

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 5/24/16 13:18
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

	Container	Preservative	Holding Time	Analysis
1 -	~~8 oz glass~~ 4 oz whirl pak	4 Deg C	180 Days	1 Metals in Solids by ICP-AES
0 -		4 Deg C	Days	1 Percent Solid
				1 Bioaccessible Lead in Soil by ICP-AES

Sample Comments:

(N/A)

Co-located with SW-5

NO.10 sieve = 1,475 ppm Pb

NO.60 sieve = 2,310 ppm Pb

Sample Collected By: TT

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 7153 **Sample Number:** 5 **QC Code:** __ **Matrix:** Solid **Tag ID:** 7153-5-__

Project ID: CMA7D24 **Project Manager:** Cody McLarty
Project Desc: SW Jefferson County Mining
City: DeSoto **State:** Missouri
Program: Superfund
Site Name: SOUTHWEST JEFFERSON COUNTY MINING - UNCONSOLIDATED MINE WASTE **Site ID:** A7D2 **Site OU:** 04

Location Desc: DU 1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 5/24/16 10:00
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

	Container	Preservative	Holding Time	Analysis
1 -	~~8 oz glass~~ 4oz Whirlpak	4 Deg C	180 Days	1 Metals in Solids by ICP-AES
0 -		4 Deg C	Days	1 Percent Solid
				1 Bioaccessible Lead in Soil by ICP-AES

Sample Comments:

(N/A)

NO. 10 sieve = 2,190 ppm Pb
NO. 60 sieve = 1,962 ppm Pb

Sample Collected By: TT

Sample Collection Field Sheet

US EPA Region 7
Kansas City, KS

ASR Number: 7153 **Sample Number:** 5 **QC Code:** FD **Matrix:** Solid **Tag ID:** 7153-5-FD

Project ID: CMA7D24 **Project Manager:** Cody McLarty
Project Desc: SW Jefferson County Mining
City: DeSoto **State:** Missouri
Program: Superfund
Site Name: SOUTHWEST JEFFERSON COUNTY MINING - UNCONSOLIDATED MINE WASTE **Site ID:** A7D2 **Site OU:** 04

Location Desc: DU 1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 5/24/16 10:00

Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

	Container	Preservative	Holding Time	Analysis
1 -	~~8 oz glass~~ 4oz Whirlpak	4 Deg C	180 Days	1 Metals in Solids by ICP-AES
0 -		4 Deg C	Days	1 Percent Solid
				1 Bioaccessible Lead in Soil by ICP-AES

Sample Comments:

(N/A)

NO.10 sieve = 2,190 ppm Pb
NO.60 sieve = 1,962 ppm Pb

Sample Collected By: TT

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 7153 **Sample Number:** 6 **QC Code:** __ **Matrix:** Solid **Tag ID:** 7153-6-__

Project ID: CMA7D24 **Project Manager:** Cody McLarty
Project Desc: SW Jefferson County Mining
City: DeSoto **State:** Missouri
Program: Superfund
Site Name: SOUTHWEST JEFFERSON COUNTY MINING - UNCONSOLIDATED MINE WASTE **Site ID:** A7D2 **Site OU:** 04

Location Desc: DU3

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 5/24/16 10:44
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

	Container	Preservative	Holding Time	Analysis
1 -	~~8 oz glass~~ 4 oz whirl pak	4 Deg C	180 Days	1 Metals in Solids by ICP-AES
0 -		4 Deg C	Days	1 Percent Solid
				1 Bioaccessible Lead in Soil by ICP-AES

Sample Comments:

(N/A)

No. 10 sieve = 155ppm Pb
NO. 60 sieve = 166ppm Pb

Sample Collected By: TT

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 7153 **Sample Number:** 7 **QC Code:** __ **Matrix:** Solid **Tag ID:** 7153-7-__

Project ID: CMA7D24 **Project Manager:** Cody McLarty
Project Desc: SW Jefferson County Mining
City: DeSoto **State:** Missouri
Program: Superfund
Site Name: SOUTHWEST JEFFERSON COUNTY MINING - UNCONSOLIDATED MINE WASTE **Site ID:** A7D2 **Site OU:** 04

Location Desc: DU 4

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 5/24/16 10:44
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

	Container	Preservative	Holding Time		Analysis
1 -	~~8 oz glass~~ 4oz whirl pak	4 Deg C	180	Days	1 Metals in Solids by ICP-AES
0 -		4 Deg C		Days	1 Percent Solid
					1 Bioaccessible Lead in Soil by ICP-AES

Sample Comments:

(N/A)

No.10 sieve = 509 ppm Pb
No.60 sieve = 421 ppm Pb

Sample Collected By: TT

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 7153 **Sample Number:** 8 **QC Code:** __ **Matrix:** Solid **Tag ID:** 7153-8-__

Project ID: CMA7D24 **Project Manager:** Cody McLarty
Project Desc: SW Jefferson County Mining
City: DeSoto **State:** Missouri
Program: Superfund
Site Name: SOUTHWEST JEFFERSON COUNTY MINING - UNCONSOLIDATED MINE WASTE **Site ID:** A7D2 **Site OU:** 04

Location Desc: DU6

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 5/24/16 11:41
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

	Container	Preservative	Holding Time	Analysis
1 -	~~8 oz glass~~ 4 oz whirl pak	4 Deg C	180 Days	1 Metals in Solids by ICP-AES
0 -		4 Deg C	Days	1 Percent Solid
				1 Bioaccessible Lead in soil by ICP-AES

Sample Comments:

(N/A)

NO.10 sieve = 336 ppm Pb
NO.60 sieve = 428 ppm Pb

Sample Collected By: TT

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 7153 **Sample Number:** 101 **QC Code:** __ **Matrix:** Water **Tag ID:** 7153-101-__

Project ID: CMA7D24 **Project Manager:** Cody McLarty
Project Desc: SW Jefferson County Mining
City: DeSoto **State:** Missouri
Program: Superfund
Site Name: SOUTHWEST JEFFERSON COUNTY MINING - UNCONSOLIDATED MINE WASTE **Site ID:** A7D2 **Site OU:** 04

Location Desc: GW1, unpurged

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 5/24/16 09:07

Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 1 Liter plastic bottle	Field Filtered, HNO3 to pH<2	180 Days	1 Metals - Dissolved, in Water by ICP/MS
1 - 1 Liter plastic bottle	HNO3 acidify, 4 Deg C	180 Days	1 Metals in Water by ICP-AES
			1 Hardness in Water by Calculation
1 - 1 Liter plastic bottle	HNO3 to pH<2	180 Days	1 Metals in Water by ICP/MS

Sample Comments:

(N/A)

Sample Collected By: TT

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 7153 **Sample Number:** 102 **QC Code:** __ **Matrix:** Water **Tag ID:** 7153-102-__

Project ID: CMA7D24 **Project Manager:** Cody McLarty
Project Desc: SW Jefferson County Mining
City: DeSoto **State:** Missouri
Program: Superfund
Site Name: SOUTHWEST JEFFERSON COUNTY MINING - UNCONSOLIDATED MINE WASTE **Site ID:** A7D2 **Site OU:** 04

Location Desc: GW1, purged

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 5/24/16 09:26
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 1 Liter plastic bottle	Field Filtered, HNO3 to pH<2	180 Days	1 Metals - Dissolved, in Water by ICP/MS
1 - 1 Liter plastic bottle	HNO3 acidify, 4 Deg C	180 Days	1 Metals in Water by ICP-AES
			1 Hardness in Water by Calculation
1 - 1 Liter plastic bottle	HNO3 to pH<2	180 Days	1 Metals in Water by ICP/MS

Sample Comments:

(N/A)

Sample Collected By: TT

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 7153 **Sample Number:** 102 **QC Code:** FD **Matrix:** Water **Tag ID:** 7153-102-FD

Project ID: CMA7D24 **Project Manager:** Cody McLarty
Project Desc: SW Jefferson County Mining
City: DeSoto **State:** Missouri
Program: Superfund
Site Name: SOUTHWEST JEFFERSON COUNTY MINING - UNCONSOLIDATED MINE WASTE **Site ID:** A7D2 **Site OU:** 04

Location Desc: GW1, purged

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 5/24/16 09:26

Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 1 Liter plastic bottle	Field Filtered, HNO3 to pH<2	180 Days	1 Metals - Dissolved, in Water by ICP/MS
1 - 1 Liter plastic bottle	HNO3 acidify, 4 Deg C	180 Days	1 Metals in Water by ICP-AES
			1 Hardness in Water by Calculation
1 - 1 Liter plastic bottle	HNO3 to pH<2	180 Days	1 Metals in Water by ICP/MS

Sample Comments:

(N/A)

Sample Collected By: TT

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 7153 **Sample Number:** 103 **QC Code:** __ **Matrix:** Water **Tag ID:** 7153-103-__

Project ID: CMA7D24 **Project Manager:** Cody McLarty
Project Desc: SW Jefferson County Mining
City: DeSoto **State:** Missouri
Program: Superfund
Site Name: SOUTHWEST JEFFERSON COUNTY MINING - UNCONSOLIDATED MINE WASTE **Site ID:** A7D2 **Site OU:** 04

Location Desc: GW 2, unpurged

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High)

		Date	Time(24 hr)
Latitude: ___ ___ ___	**Sample Collection: Start:**	5/24/16	12:54
Longitude: ___ ___ ___	**End:**	__/__/__	__:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 1 Liter plastic bottle	Field Filtered, HNO3 to pH<2	180 Days	1 Metals - Dissolved, in Water by ICP/MS
1 - 1 Liter plastic bottle	HNO3 acidify, 4 Deg C	180 Days	1 Metals in Water by ICP-AES
			1 Hardness in Water by Calculation
1 - 1 Liter plastic bottle	HNO3 to pH<2	180 Days	1 Metals in Water by ICP/MS

Sample Comments:

(N/A)

Sample Collected By: TT

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 7153 **Sample Number:** 104 **QC Code:** __ **Matrix:** Water **Tag ID:** 7153-104-__

Project ID: CMA7D24 **Project Manager:** Cody McLarty
Project Desc: SW Jefferson County Mining
City: DeSoto **State:** Missouri
Program: Superfund
Site Name: SOUTHWEST JEFFERSON COUNTY MINING - UNCONSOLIDATED MINE WASTE **Site ID:** A7D2 **Site OU:** 04

Location Desc: GW2, purged

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 5/24/16 13:05

Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 1 Liter plastic bottle	Field Filtered, HNO3 to pH<2	180 Days	1 Metals - Dissolved, in Water by ICP/MS
1 - 1 Liter plastic bottle	HNO3 acidify, 4 Deg C	180 Days	1 Metals in Water by ICP-AES
			1 Hardness in Water by Calculation
1 - 1 Liter plastic bottle	HNO3 to pH<2	180 Days	1 Metals in Water by ICP/MS

Sample Comments:

(N/A)

Sample Collected By: TT

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 7153 **Sample Number:** 105 **QC Code:** __ **Matrix:** Water **Tag ID:** 7153-105-__

Project ID: CMA7D24 **Project Manager:** Cody McLarty
Project Desc: SW Jefferson County Mining
City: DeSoto **State:** Missouri
Program: Superfund
Site Name: SOUTHWEST JEFFERSON COUNTY MINING - UNCONSOLIDATED MINE WASTE **Site ID:** A7D2 **Site OU:** 04

Location Desc: SW1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** MM 24 **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 5 /~~25~~/ 16 10:30

Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 1 Liter plastic bottle	Field Filtered, HNO3 to pH<2	180 Days	1 Metals - Dissolved, in Water by ICP/MS
1 - 1 Liter plastic bottle	HNO3 acidify, 4 Deg C	180 Days	1 Metals in Water by ICP-AES
			1 Hardness in Water by Calculation
1 - 1 Liter plastic bottle	HNO3 to pH<2	180 Days	1 Metals in Water by ICP/MS

Sample Comments:

(N/A)

* CO-located with Sediment 1

Sample Collected By: TT

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 7153 **Sample Number:** 106 **QC Code:** __ **Matrix:** Water **Tag ID:** 7153-106-__

Project ID: CMA7D24 **Project Manager:** Cody McLarty
Project Desc: SW Jefferson County Mining
City: DeSoto **State:** Missouri
Program: Superfund
Site Name: SOUTHWEST JEFFERSON COUNTY MINING - UNCONSOLIDATED MINE WASTE **Site ID:** A7D2 **Site OU:** 04

Location Desc: SW 2

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 5/24/16 11:08

Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 1 Liter plastic bottle	Field Filtered, HNO3 to pH<2	180 Days	1 Metals - Dissolved, in Water by ICP/MS
1 - 1 Liter plastic bottle	HNO3 acidify, 4 Deg C	180 Days	1 Metals in Water by ICP-AES
			1 Hardness in Water by Calculation
1 - 1 Liter plastic bottle	HNO3 to pH<2	180 Days	1 Metals in Water by ICP/MS

Sample Comments:

(N/A)

Co-located with Sediment 3

Sample Collected By: TT

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 7153 **Sample Number:** 107 **QC Code:** __ **Matrix:** Water **Tag ID:** 7153-107-__

Project ID: CMA7D24 **Project Manager:** Cody McLarty
Project Desc: SW Jefferson County Mining
City: DeSoto **State:** Missouri
Program: Superfund
Site Name: SOUTHWEST JEFFERSON COUNTY MINING - UNCONSOLIDATED MINE WASTE **Site ID:** A7D2 **Site OU:** 04

Location Desc: SW3

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 5/24/16 12:10

Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 1 Liter plastic bottle	Field Filtered, HNO3 to pH<2	180 Days	1 Metals - Dissolved, in Water by ICP/MS
1 - 1 Liter plastic bottle	HNO3 acidify, 4 Deg C	180 Days	1 Metals in Water by ICP-AES
			1 Hardness in Water by Calculation
1 - 1 Liter plastic bottle	HNO3 to pH<2	180 Days	1 Metals in Water by ICP/MS

Sample Comments:

(N/A)

Co-located with Sediment 5

Sample Collected By: TT

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 7153 **Sample Number:** 107 **QC Code:** FD **Matrix:** Water **Tag ID:** 7153-107-FD

Project ID: CMA7D24 **Project Manager:** Cody McLarty
Project Desc: SW Jefferson County Mining
City: DeSoto **State:** Missouri
Program: Superfund
Site Name: SOUTHWEST JEFFERSON COUNTY MINING - UNCONSOLIDATED MINE WASTE **Site ID:** A7D2 **Site OU:** 04

Location Desc: SW3

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 5/24/16 12:10

Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 1 Liter plastic bottle	Field Filtered, HNO3 to pH<2	180 Days	1 Metals - Dissolved, in Water by ICP/MS
1 - 1 Liter plastic bottle	HNO3 acidify, 4 Deg C	180 Days	1 Metals in Water by ICP-AES
			1 Hardness in Water by Calculation
1 - 1 Liter plastic bottle	HNO3 to pH<2	180 Days	1 Metals in Water by ICP/MS

Sample Comments:

(N/A)

Co-located with Sediment 5

Sample Collected By: TT

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 7153 **Sample Number:** 108 **QC Code:** __ **Matrix:** Water **Tag ID:** 7153-108-__

Project ID: CMA7D24 **Project Manager:** Cody McLarty
Project Desc: SW Jefferson County Mining
City: DeSoto **State:** Missouri
Program: Superfund
Site Name: SOUTHWEST JEFFERSON COUNTY MINING - UNCONSOLIDATED MINE WASTE **Site ID:** A7D2 **Site OU:** 04

Location Desc: SW 4

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 5/24/16 12:32

Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 1 Liter plastic bottle	Field Filtered, HNO3 to pH<2	180 Days	1 Metals - Dissolved, in Water by ICP/MS
1 - 1 Liter plastic bottle	HNO3 acidify, 4 Deg C	180 Days	1 Metals in Water by ICP-AES
			1 Hardness in Water by Calculation
1 - 1 Liter plastic bottle	HNO3 to pH<2	180 Days	1 Metals in Water by ICP/MS

Sample Comments:

(N/A)

* Not co-located with sediment
Collected by bridge, too many tree branches to collect sediment with ponar.

Sample Collected By: TT

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 7153 **Sample Number:** 109 **QC Code:** __ **Matrix:** Water **Tag ID:** 7153-109-__

Project ID: CMA7D24 **Project Manager:** Cody McLarty
Project Desc: SW Jefferson County Mining
City: DeSoto **State:** Missouri
Program: Superfund
Site Name: SOUTHWEST JEFFERSON COUNTY MINING - UNCONSOLIDATED MINE WASTE **Site ID:** A7D2 **Site OU:** 04

Location Desc: SW5

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 5/24/16 13:20
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 1 Liter plastic bottle	Field Filtered, HNO3 to pH<2	180 Days	1 Metals - Dissolved, in Water by ICP/MS
1 - 1 Liter plastic bottle	HNO3 acidify, 4 Deg C	180 Days	1 Metals in Water by ICP-AES
			1 Hardness in Water by Calculation
1 - 1 Liter plastic bottle	HNO3 to pH<2	180 Days	1 Metals in Water by ICP/MS

Sample Comments:

(N/A)

* Co-located with Sediment 8

Sample Collected By: TT

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 7153 **Sample Number:** 110 **QC Code:** FB **Matrix:** Water **Tag ID:** 7153-110-FB

Project ID: CMA7D24 **Project Manager:** Cody McLarty
Project Desc: SW Jefferson County Mining
City: DeSoto **State:** Missouri
Program: Superfund
Site Name: SOUTHWEST JEFFERSON COUNTY MINING - UNCONSOLIDATED MINE WASTE **Site ID:** A7D2 **Site OU:** 04

Location Desc: Field Blank

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 5/24/16 13:00

Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 1 Liter plastic bottle	Field Filtered, HNO3 to pH<2	180 Days	1 Metals - Dissolved, in Water by ICP/MS
1 - 1 Liter plastic bottle	HNO3 acidify, 4 Deg C	180 Days	1 Metals in Water by ICP-AES
			1 Hardness in Water by Calculation
1 - 1 Liter plastic bottle	HNO3 to pH<2	180 Days	1 Metals in Water by ICP/MS

Sample Comments:

(N/A)

Sample Collected By: TT

United States Environmental Protection Agency
Region 7
300 Minnesota Avenue
Kansas City, KS 66101

Date: 07/01/2016

Subject: Transmittal of Sample Analysis Results for ASR #: 7153

Project ID: CMA7D24

Project Description: SW Jefferson County Mining

From: Margaret E.W. St. Germain, Chief
Laboratory Technology & Analysis Branch, Environmental Sciences & Technology Division

To: Cody McLarty
SUPR/SPEB

Enclosed are the analytical data for the above-referenced Analytical Services Request (ASR) and Project. The Regional Laboratory has reviewed and verified the results in accordance with procedures described in our Quality Manual (QM). In addition to all of the analytical results, this transmittal contains pertinent information that may have influenced the reported results and documents any deviations from the established requirements of the QM.

Please contact us within 14 days of receipt of this package if you determine there is a need for any changes. Please complete the enclosed Customer Satisfaction Survey and Data Disposition/Sample Release memo for this ASR as soon as possible. The process of disposing of the samples for this ASR will be initiated 30 days from the date of this transmittal unless an alternate release date is specified on the Data Disposition/Sample Release memo.

If you have any questions or concerns relating to this data package, contact our customer service line at 913-551-5295.

Enclosures

cc: Analytical Data File.

Project Manager: Cody McLarty Org: SUPR/SPEB Phone: 913-551-7974

Project ID: CMA7D24 QAPP Number: 2016167

Project Desc: SW Jefferson County Mining

Location: DeSoto State: Missouri Program: Superfund

Site Name: SOUTHWEST JEFFERSON COUNTY MINING - UNCONSOLIDATED MINE WASTE Site ID: A7D2 Site OU: 04

GPRA PRC: 303DC6

Purpose: Site Characterization

Removal site evaluation.
Additional EPA PM: Greg Bach.

Explanation of Codes, Units and Qualifiers used on this report

Sample QC Codes: QC Codes identify the type of sample for quality control purpose.

__ = Field Sample
FB = Field Blank
FD = Field Duplicate

Units: Specific units in which results are reported.

mg/L = Milligrams per Liter
ug/L = Micrograms per Liter
mg/kg = Milligrams per Kilogram
% = Percent

Data Qualifiers: Specific codes used in conjunction with data values to provide additional information on the quality of reported results, or used to explain the absence of a specific value.

(Blank) = Values have been reviewed and found acceptable for use.
J = The identification of the analyte is acceptable; the reported value is an estimate.
UJ = The analyte was not detected at or above the reporting limit. The reporting limit is an estimate.
U = The analyte was not detected at or above the reporting limit.

Project ID: CMA7D24 Project Desc: SW Jefferson County Mining

Sample No	QC Code	Matrix	Location Description	External Sample No	Start Date	Start Time	End Date	End Time	Receipt Date
1	__	Solid	Sediment 1		05/24/2016	10:30			06/03/2016
2	__	Solid	Sediment 3		05/24/2016	11:08			06/03/2016
3	__	Solid	Sediment 7		05/24/2016	13:11			06/03/2016
4	__	Solid	Sediment 8		05/24/2016	13:18			06/03/2016
5	__	Solid	DU1		05/24/2016	10:00			06/03/2016
5	FD	Solid	DU1		05/24/2016	10:00			06/03/2016
6	__	Solid	DU3		05/24/2016	10:44			06/03/2016
7	__	Solid	DU4		05/24/2016	10:44			06/03/2016
8	__	Solid	DU6		05/24/2016	11:41			06/03/2016
101	__	Water	GW1, Unpurged		05/24/2016	09:07			06/03/2016
102	__	Water	GW1, Purged		05/24/2016	09:26			06/03/2016
102	FD	Water	GW1, Purged		05/24/2016	09:26			06/03/2016
103	__	Water	GW2, Unpurged		05/24/2016	12:54			06/03/2016
104	__	Water	GW2, Purged		05/24/2016	13:05			06/03/2016
105	__	Water	SW1		05/24/2016	10:30			06/03/2016
106	__	Water	SW2		05/24/2016	11:08			06/03/2016
107	__	Water	SW3		05/24/2016	12:10			06/03/2016
107	FD	Water	SW3		05/24/2016	12:10			06/03/2016
108	__	Water	SW4		05/24/2016	12:32			06/03/2016
109	__	Water	SW5		05/24/2016	13:20			06/03/2016
110	FB	Water	Field Blank		05/24/2016	13:00			06/03/2016

Analysis	Comments About Results For This Analysis

1 Bioaccessible Lead in Soil by ICP-AES

Lab: Region 7 EPA Laboratory - Kansas City, Ks.

Method: EPA Region 7 RLAB Method 3122.3F BioAv

Basis: Dry

Samples: 1-__ 2-__ 3-__ 4-__ 5-__ 5-FD 6-__
7-__ 8-__

Comments:

1 Metals in Solids by ICP-AES

Lab: Region 7 ESAT Contract Lab (In-House)

Method: EPA Region 7 RLAB Method 3122.3F

Basis: Dry

Samples: 1-__ 2-__ 3-__ 4-__ 5-__ 5-FD 6-__
7-__ 8-__

Comments:
Antimony (25,27,75-112) was UJ-coded in sample 1. This analyte was not found in the sample at or above the reporting limit, however, the reporting limit is an estimate (UJ-coded) due to low recovery of this analyte in the laboratory matrix spike. The actual reporting limit for this analyte may be higher than the reported value.

Cadmium (67,67,75-105) was J-coded in sample 1. Although the analyte in question has been positively identified in the sample, the quantitation is an estimate (J-coded) due to low recovery of this analyte in the laboratory matrix spike. The actual concentration for this analyte may be higher than the reported value.

Cobalt (73,72,75-109) was J-coded in sample 1. Although the analyte in question has been positively identified in the sample, the quantitation is an estimate (J-coded) due to low recovery of this analyte in the laboratory matrix spike. The actual concentration for this analyte may be higher than the reported value.

Magnesium (84,85-119) was J-coded in sample 1. Although the analyte in question has been positively identified in the sample, the quantitation is an estimate (J-coded) due to low recovery of this analyte in the laboratory matrix spike. The actual concentration for this analyte may be higher than the reported value.

Molybdenum (70,69,75-106)was UJ-coded in sample 1. This analyte was not found in the sample at or above the reporting limit, however, the reporting limit is an estimate (UJ-coded) due to low recovery of this analyte in the laboratory matrix spike. The actual reporting limit for this analyte may be higher than the reported value.

Nickel (71,73,75-105) was J-coded in sample 1. Although the analyte in question has been positively identified in the sample, the quantitation is an estimate (J-coded) due to low recovery of this analyte in the laboratory matrix spike. The actual concentration for this

Analysis Comments About Results For This Analysis

analyte may be higher than the reported value.

Thallium (67,65,75-125) was UJ-coded in sample 1. This analyte was not found in the sample at or above the reporting limit, however, the reporting limit is an estimate (UJ-coded) due to low recovery of this analyte in the laboratory matrix spike. The actual reporting limit for this analyte may be higher than the reported value.

1 Percent Solid

Lab: Region 7 ESAT Contract Lab (In-House)

Method: EPA Region 7 RLAB Method 3142.9H

Basis: N/A

Samples: 1-__ 2-__ 3-__ 4-__ 5-__ 5-FD 6-__
7-__ 8-__

Comments:
(N/A)

1 Hardness in Water by Calculation

Lab: Region 7 EPA Laboratory - Kansas City, Ks.

Method: EPA Region 7 RLAB Method 3122.3F

Samples: 101-__ 102-__ 102-FD 103-__ 104-__ 105-__ 106-__
107-__ 107-FD 108-__ 109-__ 110-FB

Comments:
(N/A)

1 Metals - Dissolved, in Water by ICP/MS

Lab: Region 7 ESAT Contract Lab (In-House)

Method: EPA Region 7 RLAB Method 3123.1D Applied to Field Filtered Samples for "Dissolved" Results

Samples: 101-__ 102-__ 102-FD 103-__ 104-__ 105-__ 106-__
107-__ 107-FD 108-__ 109-__ 110-FB

Comments:
(N/A)

1 Metals in Water by ICP-AES

Lab: Region 7 EPA Laboratory - Kansas City, Ks.

Method: EPA Region 7 RLAB Method 3122.3F

Samples: 101-__ 102-__ 102-FD 103-__ 104-__ 105-__ 106-__
107-__ 107-FD 108-__ 109-__ 110-FB

Analysis	Comments About Results For This Analysis

Comments:
(N/A)

1 Metals in Water by ICP/MS

Lab: Region 7 ESAT Contract Lab (In-House)

Method: EPA Region 7 RLAB Method 3123.1D

Samples: 101-__ 102-__ 102-FD 103-__ 104-__ 105-__ 106-__
107-__ 107-FD 108-__ 109-__ 110-FB

Comments:
(N/A)

Analysis/ Analyte	Units	1-__	2-__	3-__	4-__
1 Bioaccessible Lead in Soil by ICP-AES					
Lead, Bioaccessible	%	83.8	63.3	77.3	79.0
Lead, Total in sieved portion	mg/kg	1990	612	890	3210
1 Metals in Solids by ICP-AES					
Aluminum	mg/kg	8960	9970	6080	5510
Antimony	mg/kg	2.4 UJ	2.2 U	2.1 U	2.0 U
Arsenic	mg/kg	5.9 U	9.0	9.6	13.4
Barium	mg/kg	734	1070	509	248
Beryllium	mg/kg	1.2 U	1.1 U	1.0 U	1.0 U
Cadmium	mg/kg	3.3 J	1.1 U	1.0 U	2.8
Calcium	mg/kg	43500	65000	79000	80400
Chromium	mg/kg	8.2	12.5	7.3	2.2
Cobalt	mg/kg	17.6 J	7.2	4.8	7.3
Copper	mg/kg	61.3	19.1	19.3	33.1
Iron	mg/kg	20200	20200	16000	24700
Lead	mg/kg	1970	549	875	2810
Magnesium	mg/kg	20700 J	22700	34900	33400
Manganese	mg/kg	1700	726	519	654
Molybdenum	mg/kg	2.4 UJ	2.2 U	2.1 U	2.0 U
Nickel	mg/kg	21.5 J	17.5	11.3	14.2
Potassium	mg/kg	1090	1580	518	406
Selenium	mg/kg	37.4	49.5	61.7	66.2
Silver	mg/kg	3.1	2.7	3.2	3.5
Sodium	mg/kg	70.0	90.8	108	119
Thallium	mg/kg	11.9 UJ	10.9 U	10.3 U	10.0 U
Vanadium	mg/kg	23.8	26.9	19.8	21.6
Zinc	mg/kg	770	1200	2110	3970
1 Percent Solid					
Solids, percent	%	85.8	93.3	96.2	96.9

Analysis/ Analyte	Units	5-__	5-FD	6-__	7-__
1 Bioaccessible Lead in Soil by ICP-AES					
Lead, Bioaccessible	%	85.1	86.0	58.4	64.9
Lead, Total in sieved portion	mg/kg	2070	2020	186	480
1 Metals in Solids by ICP-AES					
Aluminum	mg/kg	6990	6560	11100	11200
Antimony	mg/kg	2.1 U	2.1 U	2.1 U	2.2 U
Arsenic	mg/kg	5.2 U	5.2 U	5.3 U	6.3
Barium	mg/kg	629	606	567	1560
Beryllium	mg/kg	1.0 U	1.0 U	1.1 U	1.1 U
Cadmium	mg/kg	4.0	3.8	1.1 U	1.1 U
Calcium	mg/kg	44900	44100	6780	20200
Chromium	mg/kg	5.1	4.7	14.0	12.6
Cobalt	mg/kg	16.4	15.7	8.9	7.3
Copper	mg/kg	57.1	53.0	16.8	21.1
Iron	mg/kg	16800	16300	17600	17900
Lead	mg/kg	1860	1810	172	434
Magnesium	mg/kg	23700	23000	4770	10300
Manganese	mg/kg	1770	1740	696	625
Molybdenum	mg/kg	2.1 U	2.1 U	2.1 U	2.2 U
Nickel	mg/kg	17.0	16.3	17.1	16.4
Potassium	mg/kg	980	890	1860	1830
Selenium	mg/kg	35.1	37.9	10.7 U	18.2
Silver	mg/kg	3.0	3.0	2.1 U	2.2 U
Sodium	mg/kg	66.6	62.7	53.4 U	54.3 U
Thallium	mg/kg	10.5 U	10.5 U	10.7 U	10.9 U
Vanadium	mg/kg	17.3	16.0	27.5	27.3
Zinc	mg/kg	434	440	266	778
1 Percent Solid					
Solids, percent	%	93.9	93.9	94.4	95.0

Analysis/ Analyte	Units	8-__	101-__	102-__	102-FD
1 Bioaccessible Lead in Soil by ICP-AES					
Lead, Bioaccessible	%	89.5			
Lead, Total in sieved portion	mg/kg	448			
1 Metals in Solids by ICP-AES					
Aluminum	mg/kg	8740			
Antimony	mg/kg	2.1 U			
Arsenic	mg/kg	5.4 U			
Barium	mg/kg	1720			
Beryllium	mg/kg	1.1 U			
Cadmium	mg/kg	1.1 U			
Calcium	mg/kg	40900			
Chromium	mg/kg	10.2			
Cobalt	mg/kg	6.0			
Copper	mg/kg	16.9			
Iron	mg/kg	15800			
Lead	mg/kg	439			
Magnesium	mg/kg	14200			
Manganese	mg/kg	513			
Molybdenum	mg/kg	2.1 U			
Nickel	mg/kg	14.7			
Potassium	mg/kg	1470			
Selenium	mg/kg	32.6			
Silver	mg/kg	2.1 U			
Sodium	mg/kg	66.2			
Thallium	mg/kg	10.7 U			
Vanadium	mg/kg	22.8			
Zinc	mg/kg	935			
1 Percent Solid					
Solids, percent	%	96.1			
1 Hardness in Water by Calculation					
Hardness as CaCO3	mg/L		229	231	230
1 Metals - Dissolved, in Water by ICP/MS					
Antimony	ug/L		2.0 U	2.0 U	2.0 U
Arsenic	ug/L		1.0 U	1.0 U	1.0 U
Barium	ug/L		101	105	101
Beryllium	ug/L		1.0 U	1.0 U	1.0 U
Cadmium	ug/L		1.0 U	1.0 U	1.0 U
Chromium	ug/L		7.1	6.6	6.6
Cobalt	ug/L		1.0 U	1.0 U	1.0 U
Copper	ug/L		16.1	2.0 U	2.0 U
Lead	ug/L		1.0 U	1.0 U	1.0 U
Manganese	ug/L		4.6	4.4	4.5
Nickel	ug/L		2.3	2.0	2.0
Selenium	ug/L		5.0 U	5.0 U	5.0 U
Silver	ug/L		1.0 U	1.0 U	1.0 U
Thallium	ug/L		1.0 U	1.0 U	1.0 U

Analysis/ Analyte	Units	8-__	101-__	102-__	102-FD
Vanadium	ug/L		1.0 U	1.0 U	1.0 U
Zinc	ug/L		19.5	7.0	7.2
1 Metals in Water by ICP-AES					
Calcium	mg/L		46.6	47.6	47.0
Magnesium	mg/L		27.4	27.3	27.3
1 Metals in Water by ICP/MS					
Antimony	ug/L		2.0 U	2.0 U	2.0 U
Arsenic	ug/L		1.0 U	1.0 U	1.0 U
Barium	ug/L		104	101	101
Beryllium	ug/L		1.0 U	1.0 U	1.0 U
Cadmium	ug/L		1.0 U	1.0 U	1.0 U
Chromium	ug/L		2.0 U	2.0 U	2.0 U
Cobalt	ug/L		1.0 U	1.0 U	1.0 U
Copper	ug/L		39.7	38.1	30.1
Lead	ug/L		3.5	2.1	2.3
Manganese	ug/L		4.7	4.6	4.7
Nickel	ug/L		2.6	2.6	2.6
Selenium	ug/L		5.0 U	5.0 U	5.0 U
Silver	ug/L		1.0 U	1.0 U	1.0 U
Thallium	ug/L		1.0 U	1.0 U	1.0 U
Vanadium	ug/L		1.0 U	1.0 U	1.0 U
Zinc	ug/L		21.8	27.9	22.5

Analysis/ Analyte	Units	103-__	104-__	105-__	106-__
1 Hardness in Water by Calculation					
Hardness as CaCO3	mg/L	229	232	278	288
1 Metals - Dissolved, in Water by ICP/MS					
Antimony	ug/L	2.0 U	2.0 U	2.0 U	2.0 U
Arsenic	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
Barium	ug/L	102	100	213	220
Beryllium	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
Cadmium	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
Chromium	ug/L	6.3	6.2	7.1	4.8
Cobalt	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
Copper	ug/L	3.4	2.0 U	2.0 U	2.0 U
Lead	ug/L	1.0 U	1.0 U	4.4	1.0
Manganese	ug/L	6.2	5.1	27.7	2.9
Nickel	ug/L	6.2	3.8	2.6	2.2
Selenium	ug/L	5.0 U	5.0 U	5.0 U	5.0 U
Silver	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
Thallium	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
Vanadium	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
Zinc	ug/L	87.7	14.2	18.4	33.4
1 Metals in Water by ICP-AES					
Calcium	mg/L	47.1	47.7	57.7	58.2
Magnesium	mg/L	27.0	27.3	32.6	34.7
1 Metals in Water by ICP/MS					
Antimony	ug/L	2.0 U	2.0 U	2.0 U	2.0 U
Arsenic	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
Barium	ug/L	105	103	228	233
Beryllium	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
Cadmium	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
Chromium	ug/L	2.0 U	2.0 U	2.0 U	2.0 U
Cobalt	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
Copper	ug/L	35.8	11.4	2.0 U	2.0 U
Lead	ug/L	7.7	2.1	29.2	2.6
Manganese	ug/L	6.5	5.7	34.3	4.6
Nickel	ug/L	6.8	4.8	3.5	3.5
Selenium	ug/L	5.0 U	5.0 U	5.0 U	5.0 U
Silver	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
Thallium	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
Vanadium	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
Zinc	ug/L	245	41.2	25.6	34.1

Analysis/ Analyte	Units	107-__	107-FD	108-__	109-__
1 Hardness in Water by Calculation					
Hardness as CaCO3	mg/L	285	282	278	297
1 Metals - Dissolved, in Water by ICP/MS					
Antimony	ug/L	2.0 U	2.0 U	2.0 U	2.0 U
Arsenic	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
Barium	ug/L	219	233	222	242
Beryllium	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
Cadmium	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
Chromium	ug/L	4.4	4.9	4.8	2.0 U
Cobalt	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
Copper	ug/L	2.0 U	2.0 U	2.0 U	2.0 U
Lead	ug/L	1.2	1.3	2.1	7.9
Manganese	ug/L	9.0	8.6	30.3	4.3
Nickel	ug/L	2.2	2.3	2.3	2.2
Selenium	ug/L	5.0 U	5.0 U	5.0 U	5.0 U
Silver	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
Thallium	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
Vanadium	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
Zinc	ug/L	43.6	47.3	69.2	105
1 Metals in Water by ICP-AES					
Calcium	mg/L	57.4	57.1	56.3	57.8
Magnesium	mg/L	34.4	33.9	33.3	37.0
1 Metals in Water by ICP/MS					
Antimony	ug/L	2.0 U	2.0 U	2.0 U	2.0 U
Arsenic	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
Barium	ug/L	234	228	235	236
Beryllium	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
Cadmium	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
Chromium	ug/L	2.0 U	2.0 U	2.0 U	2.0 U
Cobalt	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
Copper	ug/L	2.0 U	2.0 U	2.0 U	2.0 U
Lead	ug/L	5.9	3.8	6.8	12.6
Manganese	ug/L	15.1	10.8	36.8	5.7
Nickel	ug/L	3.6	3.5	3.7	2.7
Selenium	ug/L	5.0 U	5.0 U	5.0 U	5.0 U
Silver	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
Thallium	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
Vanadium	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
Zinc	ug/L	52.5	43.8	68.5	106

Analysis/ Analyte	Units	110-FB
1 Hardness in Water by Calculation		
Hardness as CaCO3	mg/L	13.2 U
1 Metals - Dissolved, in Water by ICP/MS		
Antimony	ug/L	2.0 U
Arsenic	ug/L	1.0 U
Barium	ug/L	5.0 U
Beryllium	ug/L	1.0 U
Cadmium	ug/L	1.0 U
Chromium	ug/L	2.0 U
Cobalt	ug/L	1.0 U
Copper	ug/L	2.0 U
Lead	ug/L	1.0 U
Manganese	ug/L	1.0 U
Nickel	ug/L	1.0 U
Selenium	ug/L	5.0 U
Silver	ug/L	1.0 U
Thallium	ug/L	1.0 U
Vanadium	ug/L	1.0 U
Zinc	ug/L	2.0 U
1 Metals in Water by ICP-AES		
Calcium	mg/L	2.00 U
Magnesium	mg/L	2.00 U
1 Metals in Water by ICP/MS		
Antimony	ug/L	2.0 U
Arsenic	ug/L	1.0 U
Barium	ug/L	5.0 U
Beryllium	ug/L	1.0 U
Cadmium	ug/L	1.0 U
Chromium	ug/L	2.0 U
Cobalt	ug/L	1.0 U
Copper	ug/L	2.0 U
Lead	ug/L	1.0 U
Manganese	ug/L	1.0 U
Nickel	ug/L	1.0 U
Selenium	ug/L	5.0 U
Silver	ug/L	1.0 U
Thallium	ug/L	1.0 U
Vanadium	ug/L	1.0 U
Zinc	ug/L	2.0 U

United States Environmental Protection Agency
Region VII
300 Minnesota Avenue
Kansas City, KS 66101

Transmittal Date: __/__/____

Subject: Data Disposition/Sample Disposition for ASR : 7153

Project ID: CMA7D24

Project Description: SW Jefferson County Mining

From: Cody McLarty
SUPR/SPEB

To: Alisha Claycamp
ENST/LTAB/LABS

I have received and reviewed the Transmittal of Sample Analysis Results for the above-referenced Analytical Services Request(ASR) and have indicated my findings below by checking one of the boxes for Data Disposition and Sample Disposition.

I understand all samples will be disposed of unless samples are requested to be held. If I do not return this form within 30 days of the transmittal all samples will have a waste determination made and scheduled for disposal.

Data Disposition

☐ "RELEASED" - Read-only to all Region 7 employees and contractors that have R7LIMS "Customer" account. All Samples may be disposed of upon receipt of this form if not requested to

☐ "Project Manager Accessible" - Available on the LAN in R7LIMS for my use only. All Samples may be disposed of upon receipt of this form if not requested to be held.

☐ "Archived" - THIS DATA IS OF A SENSITIVE NATURE. Any future reports must be requested through the laboratory. All samples may be disposed of upon receipt of the form if not requested to be held.

Sample Disposition

☐ No longer need samples for site characterization

☐ Hold Samples - I have determined that the samples need to be held until _____, after which time they will be disposed of in accordance with applicable regulations.
The reason for the hold is:

☐ Samples are associated with a legal proceeding.

☐ Question/Concern with data - possible reanalysis requested.

☐ Other:_____